DEN-SIN®

ULTIMATE WATER JETTING SOLUTION

C-2070E

Electric Powered

Ultra High Pressure Water Blaster Machine

www.densin.com

Introductions

Congratulations on your purchase of the **DEN-SIN C-2070E** UHP Water Blaster.

DEN-SIN makes no warranty of any kind with regards to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

DEN-SIN expressly disclaims all responsibility and liability for the installation, use, purpose, maintenance, and support of third party products.

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Warning
Read this user manual before you start up your Water Blaster the first time.

This machine is a Water Blaster producing water jet under high-pressure, which is why severe injuries can occur if the safety precautions are not observed.
Therefore a full understanding of the contents of this instruction manual is required, in order to prevent injuries to you, objects and persons near by.

Safety
The following symbols are used in this manual to indicate procedures that if not followed, may results in personal injuries or damage to equipment.

WARNING

WARNING is used to alert the reader of procedures or practice which if not followed correctly could result in personal injuries.

CAUTION

CAUTION is used to alert the reader of procedures or practice which if not followed correctly could result in damage to machine or other equipment.

NOTE

NOTE is used to highlight important information that may assist the reader carrying out the procedure or understanding the text.

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The information contained in this user guide is subject to change without notice.

1. Getting Acquainted With Your UHP Water Blaster

Fast And Efficient Cleaning

The **DEN-SIN** UHP Water Blaster C-2070E enables you to get more cleaning done in less time.

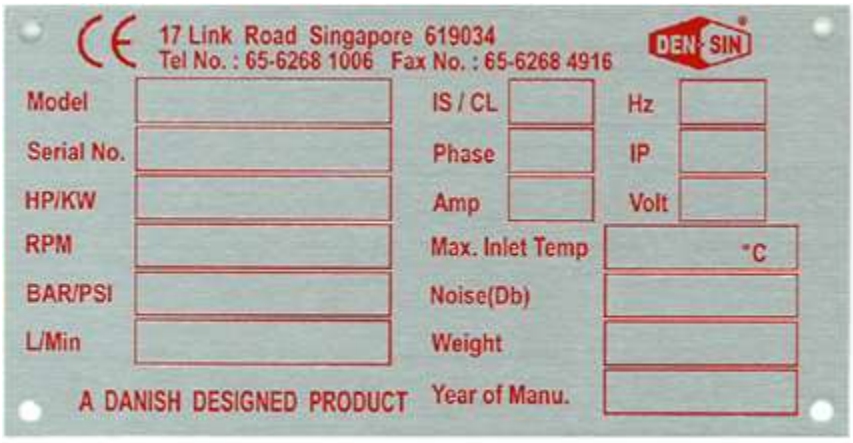
This **DEN-SIN** cold water UHP Water Blaster offers you high performance and a design optimized for heavy duty use. The design of the surrounding frame safeguard the vital parts during transport and use, and the high performance gives you the opportunity to solve an array of blasting tasks. The Water Blaster is designed for industrial and for offshore use. All pump parts fittings and pipes in contact with water are made of non-corrosive materials. Together with the carbide coated plungers, long life seals and stainless steel valves, it ensures long life and high durability.

Specifications

Model	Motor		Motor Speed	Working Pressure		Flow Capacity		Power Supply	Dimensions LxWxH	Weight
	Hp	kW	rpm	psi	Bar	gpm	l/min	Voltage	mm	kg
C-2070/26E 50Hz	125	92	1450	30000	2070	6.8	26	415 V 50Hz	2380x1400x1850	1700
C-2070/26E 60Hz	125	92	1750	30000	2070	6.8	26	440 V 60Hz	2380x1400x1850	1700

ID-Plate

Refer to the identification plate on the machine:



Identity Plate will be located on the coupling shield or main frame

Applications

These UHP Water Blasters are capable of removing any kind of dirt:

Descaling
Surface preparation
Paint and rust removal
Concrete roughening / removal

And with the option for use of accessories even many more jobs are to be dealt with.

This machine is only to be used for the purposes it is designed for. Any other use shall be considered improper and therefore potentially dangerous. The manufacturer is NOT to be held responsible for any damages caused by improper use.

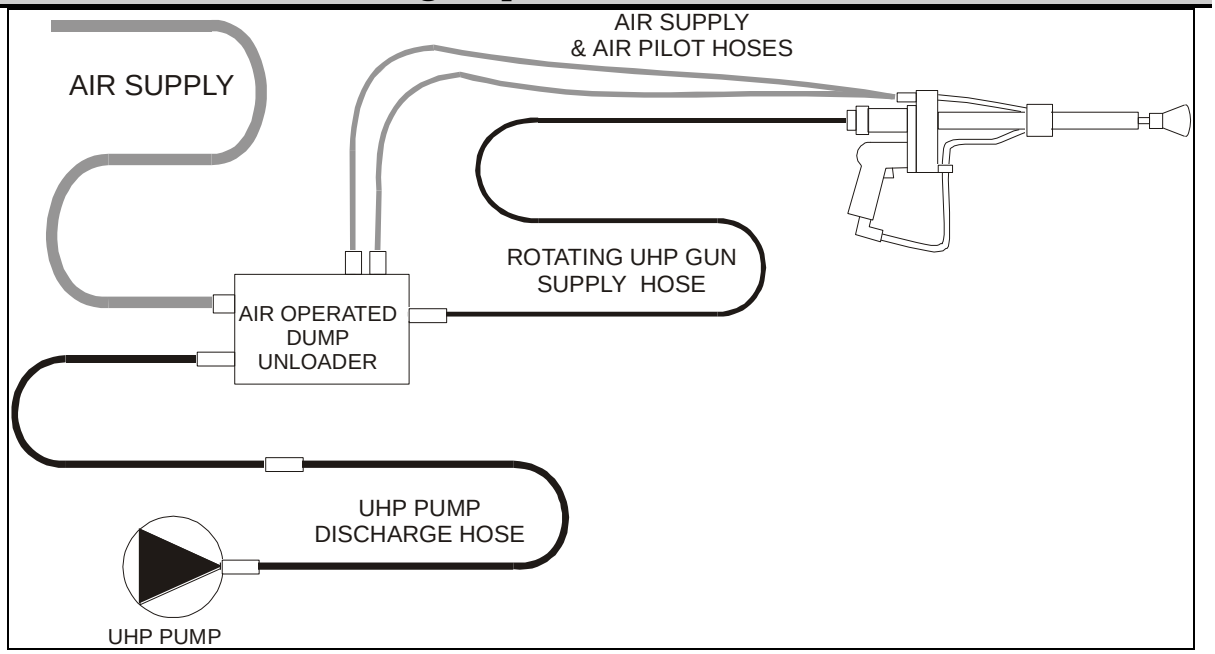
Unpacking
Remove the UHP Water Blaster and its accessories from the packing material, if any. For transport and packing reasons some accessories may be supplied disassembled.

Make sure all components are present:

- Water Blaster machine itself
- High pressure hose(s)
- Trigger gun(s) with lance(s)
- Remote Pneumatic un-loader(s)
- Water inlet hose coupling for 11/2" hose
- Operation manual/Spare-parts book
- Any ordered optional accessories and spare-parts

Hose/Tumblebox Connection

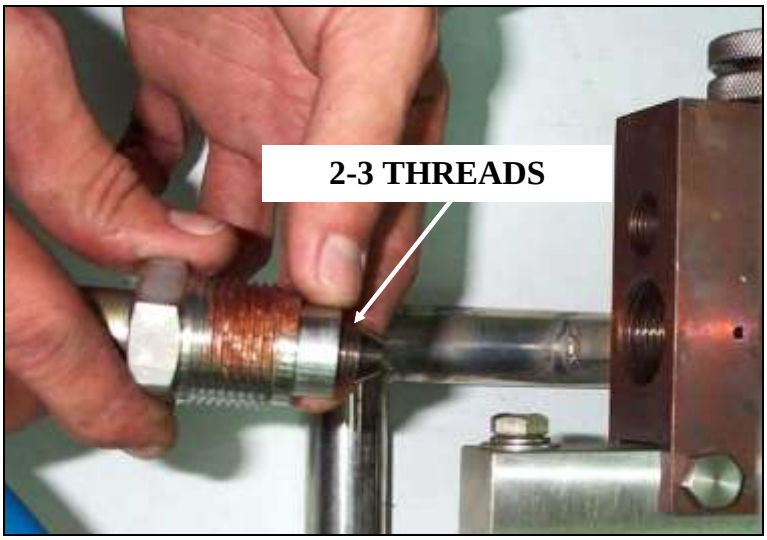
SINGLE MODE DIAGRAM



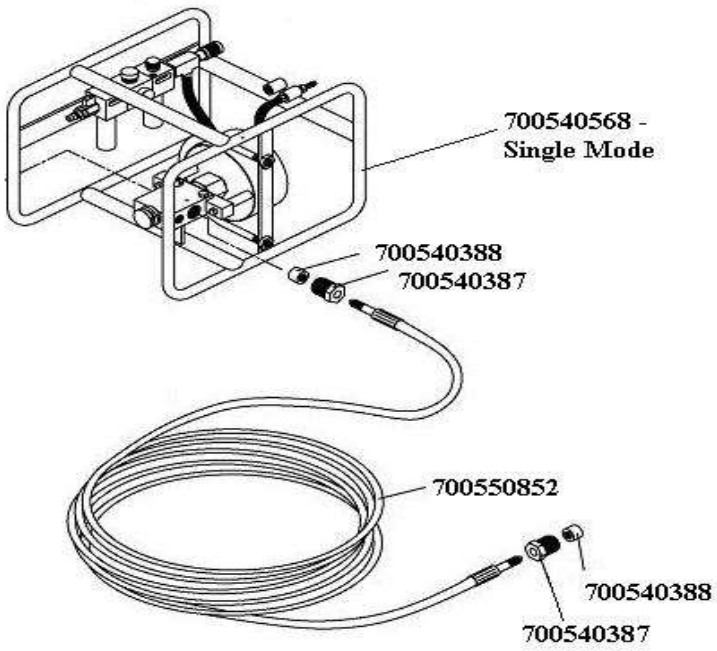
NOTE

IMPORTANT: Required Airflow and Pressure; 20CFM or 600l/min @ 7 bar

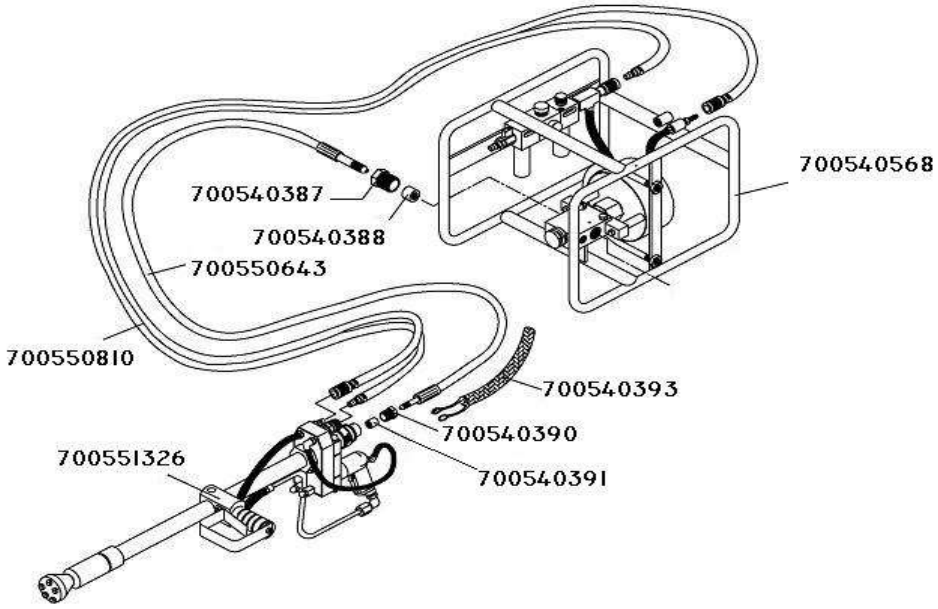
1) The tumble box is provided with 9/16" HP connections on one side of the body. The high pressure water supply from the pump is connected to the inlet side, and the hose to the gun is connected to the 3/8" HP outlet.
When tightening the hoses ensure that there are **2** to **3** threads protruding from the collar.



2) Connect the other end of the hose to the inlet on the remote pneumatic un-loader as shown in the picture.



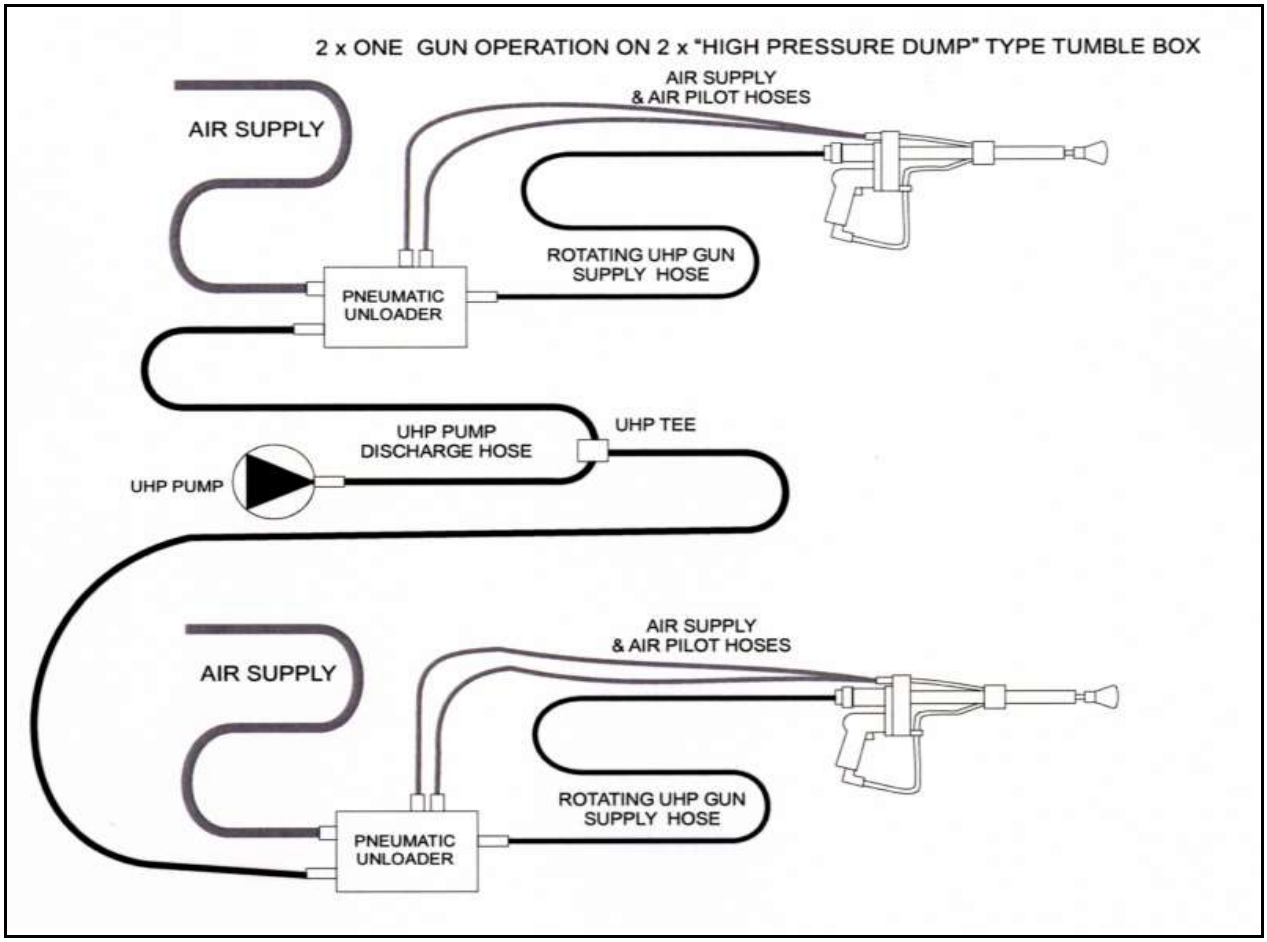
3) Connect the trigger gun hoses with the attached air-hoses. Always use two wrenches when tightening the hoses to the rotating gun. Remove the nozzle from the nozzle carrier.



WARNING

ALWAYS FLUSH THE SYSTEM TO REMOVE ANY PARTICLE THAT MAY CHOKE THE NOZZLE, CAUSING AN OVER-PRESSURE.
ONLY FIX THE NOZZLES AFTER THE SYSTEM HAD BEEN THOROUGHLY FLUSHED.

DUAL MODE DIAGRAM


2 x ONE GUN OPERATION ON 2 x "HIGH PRESSURE DUMP" TYPE TUMBLE BOX
AIR SUPPLY
AIR SUPPLY & AIR PILOT HOSES
ROTATING UHP GUN SUPPLY HOSE
PNEUMATIC UNLOADER
UHP PUMP DISCHARGE HOSE
UHP TEE
UHP PUMP
AIR SUPPLY
AIR SUPPLY & AIR PILOT HOSES
ROTATING UHP GUN SUPPLY HOSE
PNEUMATIC UNLOADER

NOTE

IMPORTANT: Required Airflow and Pressure; **20CFM** or **600l/min @ 7 bar** for each guns and tumbleboxes.

1) Close the Air Shut-Off/Exhaust Valve on Part No. 77408674 (Item No. 16).

2) Connect air to upstream side of Air Dryer/Regulator on Part No. 77408674 (Item No. 16)

3) Connect High Pressure Water Supply line from pump to 9/16" HP connection on the Valve Block: Part No. 77408808 (Item No. 20)

4) Connect a high pressure water line from the 3/8" connection on the opposite side of the valve block to the swivel on the back of the gun.

5) Connect an air line from the gun, not exceeding 7.5m long, to the Female QD Connector downstream of Air Shut-Off / Exhaust Valve on Part No. 77408674 (Item No. 16), to air inlet on gun.

6) Connect Pilot air line, not exceeding 7.5m long, from the gun to the Male Push-Lock Connector: Part No. 77408661 (Item No. 14), on Quick Exhaust Valve.

7) Open Air Shut-Off / Exhaust Valve and adjust Air Regulator on Part No. 77408674. (Item No. 16), to give a minimum pressure of 90 psi, and a maximum pressure of 100 psi.

8) Operate gun by pressing both triggers simultaneously.

9) Adjust the lubricator to 10 drops per minute while the gun is being operated. (To recharge oil reservoir use 10W machine oil).

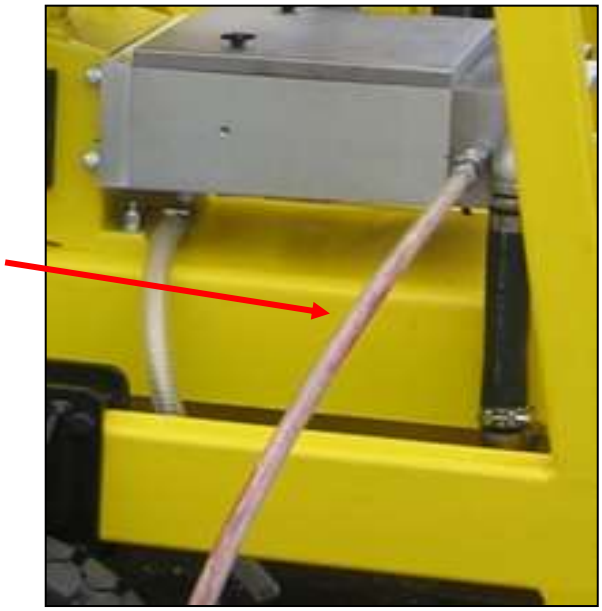
10) Item No. 46, Part No. 700540328, this elbow must be installed and is required for the diffuser to function properly. A discharge hose can be installed should there be a need to return the discharged fluid back to the tank.

NOTE

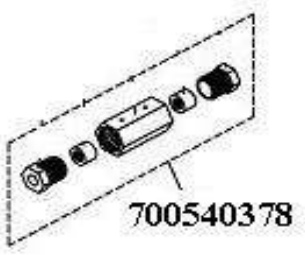
After installation of the new cartridge, in some cases there may be some initial leakage from the dump diffuser and hose assembly. This is due to the metal-to-metal seat in the cartridge. Cycling the gun on and off a few times should sol

Hose / Pump Connection

1) Connect 9/16" high-pressure hose(s) (700550852) to the adaptor located on the left hand side of cylinder head.

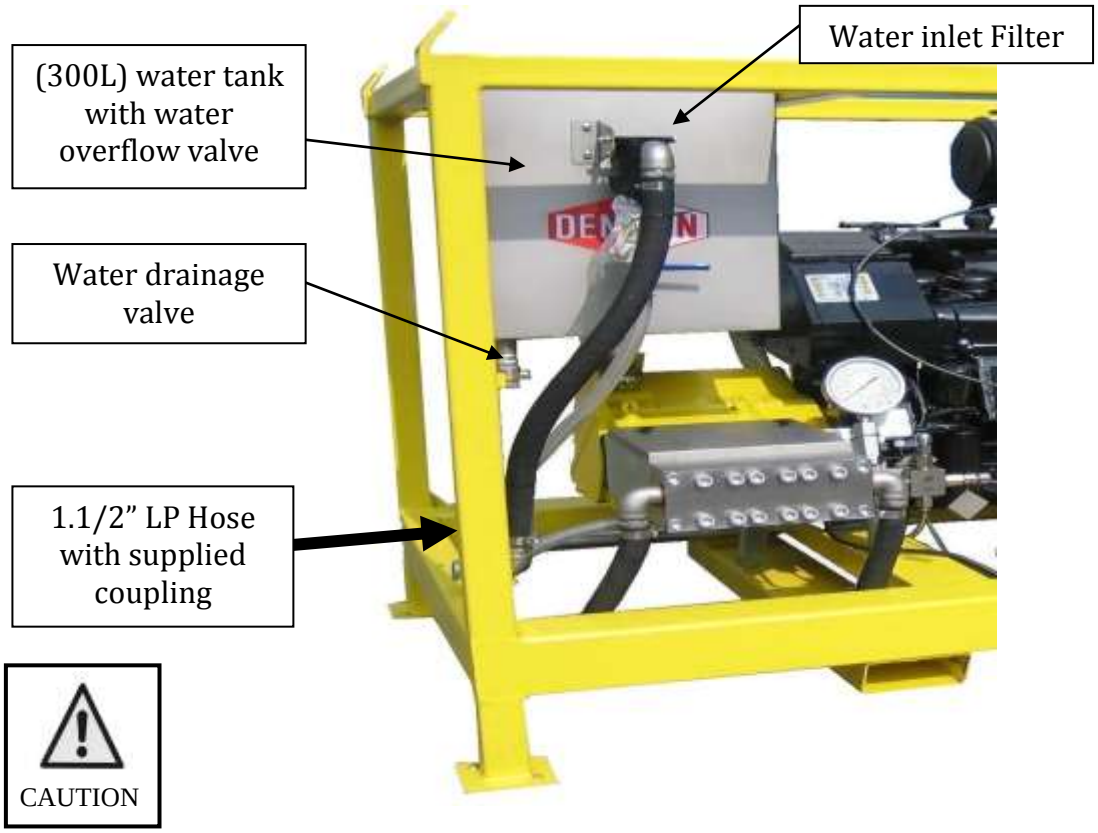


2) If required, the second hose could be joined up by means of a straight connector (700540378).



Water Supply Connection

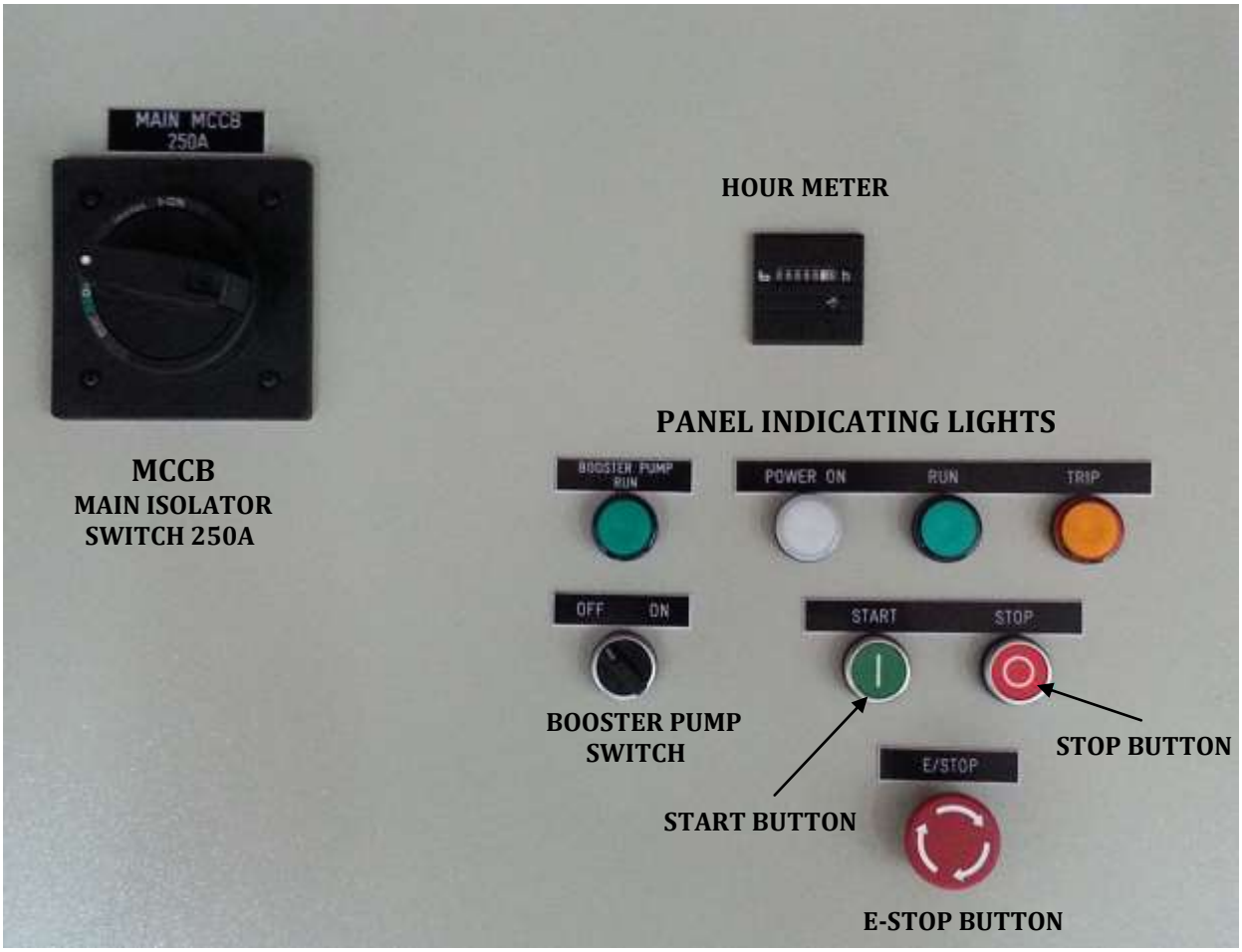
1) Attaching a 1.1/2" hose to the supplied low-pressure inlet coupling on the frame.
2) Connect the other end of the water supply hose to a ***fresh water*** tap.
3) Turn on the tap.
4) To prevent overflowing, always use the float valve inlet.


Water inlet Filter
(300L) water tank with water overflow valve
Water drainage valve
1.1/2" LP Hose with supplied coupling
CAUTION

ALWAYS FLUSH THE SYSTEM TO REMOVE ANY PARTICLE THAT MAY CHOKE THE NOZZLE, CAUSING AN OVER-PRESSURE.

ONLY FIX THE NOZZLES AFTER THE SYSTEM HAD BEEN THOROUGHLY FLUSHED.

Control Panel



Operations

Safe operating:

CAUTION

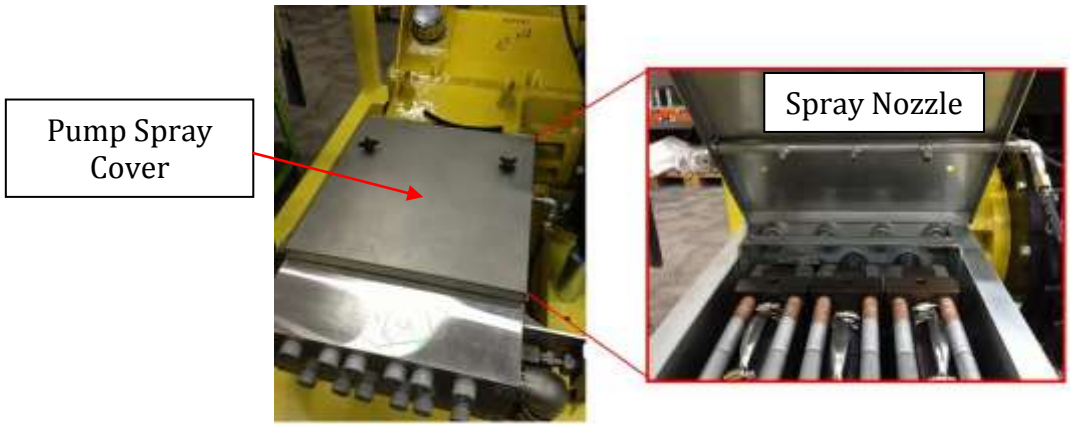
Make sure your local power supply specifications are in accordance with the motor's requirement. Refer to the ID-plate located at the coupling-cover or on the frame of the UHP machine.

Start-up:

1) Turn the emergency stop button clockwise to unlock it.

2) Switch on the booster pump (Water will start dumping from the unloader). If the machine has been complete drained, loosen the air bleed screw on the booster pump until booster pressure of 5-7 bar is achieved.

3) Lift up the pump cover and check that the cooling spray is directed into the 3 holes at the cylinder back-plate



Shut down: (Normal)

Depress the stop button but leave the booster pump running.
Only switch off the booster pump after the main pump has comes to a complete stop.
Failure to do so may damage the pump

Shut down: (Emergency)

The system has an **EMERGNCY STOP** button located on the control panel. Once depress, the motor and booster pump will stop immediately.

One gun operation:

Once motor has reach full speed, depress both the front trigger and the air motor trigger. (Pneumatic un-loader should stop dumping). The gun will operate at high pressure.

Two gun operation:

Once motor has reach full speed. Activate both guns, ensure that pressure is equal with two guns running, one gun running and both guns unloading. Reconfigure nozzles to obtain equal pressure.
The nozzle configuration on the gun should be matched so that desired pressure is reached at full speed. Reconfigure nozzles if pressure is too low or too high if in doubt please contact DEN-SIN for assistance.

Filter Maintenance And Filter Change

Standard :

Filter with bag type of filter is washable and can reuse for a few times before need to be changed.

Optional:

The filter fiber cartridges inside Stainless Steel filters are not flushable and should be replaced with new cartridges when clogged.

Water inlet pressure gauges, one before and one after the filters should indicate Approximately the same pressure (6-7 bar) when running the machine. When the gauge after the filters, the one closest to the inlet at the pump-head shows significantly lower pressure than the gauge at the booster pump, before the filters, it indicates a pressure drop through the filters
and their cartridges should be replaced. Always replace both filter cartridges. Clogged filters
may inflict cavitation in the high-pressure pump leading to severe damage of the pump.

CAUTION

Pressure reads below 4 bar indicates filter maintenance (bag) or replacement (cartridge) is required!

Notice Un-loading cycle:
Do not let the machine unload the water for prolonged periods of time. This is especially valid when running two-gun operation.

Salt-water:
When running the UHP on salt/sea-water supply, the machine MUST always be flushed **with** fresh water at the end of each use. More frequent filter change is recommended. Running the machine on salt-water supply may shorten the life of the pump and pump parts.

2. Safety And Protection Information

IMPORTANT MEDICAL INFORMATION

Immediate hospital attention should be given personnel who sustain equipment related injuries while operating the system. In such cases, it is vital that medical personnel be apprised of all facts relevant to such injuries. Therefore, all operating personnel should be provided with waterproof emergency medical alert tags or cards, describing the nature of their work and the possibility of injury inherent in the use of water jetting equipment. The below example of a standard card can be photo copied, laminated and used as medical alert tag.

IMPORTANT MEDICAL INFORMATION

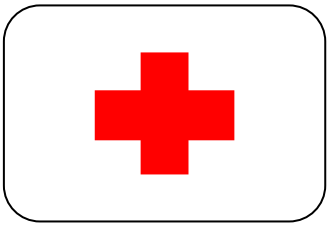
WARNING

Obtain medical treatment immediately for ANY high-pressure water-jet injuries.

Inform the doctor of the cause of the injury.

Show this card to the doctor.

This card is to be carried by personnel working with high-pressure water jetting equipment.



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5 Tuas Ave 2, Singapore 639445
Tel: +65 6268 1006 Fax: +65 62684916

MEDICAL ALERT NOTE TO PHYSICIAN

This patient may be suffering from a water jet injury. Evaluation and management should parallel that of a gunshot injury. The external manifestations of the injury cannot be used to predict the extent of internal damage. Initial management should include stabilization and a thorough neurovascular examination.
X-rays can be used to access subcutaneous air and foreign bodies distant from the site of injury. Injuries to the extremities can involve extensive nerve, muscle, vessel damage, as well as cause a distal compartment syndrome. Injuries to the torso can involve internal organ damage. Surgical consultation should be obtained. Aggressive irrigation and debridement is recommended.

Surgical decompression and exploration may also be necessary. Angiographic irrigation studies are recommended pre-operatively if arterial injury is suspected. Bandages with a hygroscopic solution ($MgSO_4$) and hyperbaric oxygen treatment have been used as adjunctive therapy to decrease pain, edema and subcutaneous emphysema.
Unusual infections with uncommon organisms in immune competent patients have been seen; the source of the water is important in deciding on initial, empiric antibiotic treatment, and broad spectrum intravenous antibiotics should be administered.
Cultures should be obtained

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Safety Precautions

Eye protection- Operators must wear visors and goggles to guard against spray and flying debris. A combination of both goggles and visor is advisable. And will protect the eyes and the face during both water-blasting as well as abrasive water-blasting **Head protection-** Helmets must be worn at all time by personnel within the work area. Helmet material must be able to withstand mechanical shock without fracturing. **Hearing protection-** Operators and other personnel exposed to noise levels of more than 90-dBa for more than 1 hour must wear suitable ear protection. Ear plugs or ear muffs are usually sufficient.	
Hand protection- Shear proof gloves must be worn by the operator at all times. A glove combination of a cloth inner lining and a water tight outer layer is preferred.	
Foot protection- Safety footwear with steel toecaps must be worn. Basic safety footwear must also be equipped with metatarsal guards to protect the instep. Safety boots are available in other designs than the illustration. **Gaiters-** This is an additional layer of protection to the user foot that are not protected by the steel top cap. It is intended to be worn outside of the user's regular protective boots. Five clips ensure that gaiters securely stay in place. The entire area is protected. Very comfortable and light to wear.	
Body protection- Waterproof garments protect the operator only from spray and flying debris. They do NOT deflect direct jet impact. Therefore, an operator must take care never to point a water-jet either at themselves or other personnel. **Hose protection-** Protect user from high pressure water injuries incase hose connection is loose.	

General Safety & Application Guidelines

1) Treat the machine as a high-speed cutting tool.

2) Anyone under the age of 18 is NOT allowed to use the machine.

3) Always use a proper plug and socket specially designed with ground to earth wiring. Only connect to an installation with earth wiring. A certified electrician shall make the installation. It is strongly recommended that the electric supply to the machine include a Residual Current Device/GFCI.

4) Always keep the Water Blaster and its accessories in good working condition. Check the machine for defects, especially the insulation on the electric cable. DO NOT start up the machine if there is any defect. Have the machine serviced.

5) When using the Water Blaster and its accessories, eye protection must be worn to protect against repelling or ricocheting matters causing eye damage.

6) Suitable clothing and footwear must be worn while using the equipment to protect the operator. Do not try to clean clothes or footwear with the machine.

7) Precautions must be made to keep bystanders away from the working range.

8) DO NOT spray-clean on yourself, others or live animals. The high-pressure jets are capable of making severe injuries.

9) DO NOT spray at electrical equipment OR the machine itself.

10) While repairing or servicing the equipment and its accessories always make sure the machine is turned off and disconnected from the main power supply.

11) Only allow instructed personnel to operate the machine.

12) Activating the trigger/gun can cause backward force therefore always hold spray lance with both hands.

13) When pausing during operation, turned off the main switch of the machine and ensures that the trigger/gun is locked.

14) Only use high-pressure hoses, connections and nozzles specified by DEN-SIN.

15) **IMPORTANT** – Do not use the machine in a possible explosive environment in accordance with EN-50014.

WARNING

To prevent accidents from happening, ensure the safety of the person(s) who uses the equipment and to protect bystanders and nearby placed inventory or machinery, a few safety precautions needs attention jobs.

Application Guidelines

1) It is not allowed to clean asbestos containing surfaces with high-pressure, unless using special equipment.

2) Persons under the influence of alcohol, drugs or medicine should not operate the machine.

3) Do not touch the electrical plug and socket with wet hands.

4) Always unplug power supply when cleaning and maintaining the machine.

5) Do not use the machine if important parts are damaged – i.e. safety devices, high-pressure hoses, spray handle.

6) The user is obliged to observe all national working environment and working safety regulations concerning “operation of high-pressure washers”.

7) It is not allowed to connect this machine directly to a potable water supply.

8) If the machine is to be connected to potable water supply it is strictly necessary to fit the machine with a water break tank, in accordance with EN1717.

3. Maintenance and troubleshooting

Maintenance Schedule

	Daily/Each use	1st 100hrs	Every month / Every 500hrs	When needed	Procedure / Remarks
Check pump oil level	◇		◇		• Top up if necessary.
Change pump oil **Recommended Oil :** ISO Grade 220 **Usage :** Approx. 15L of oil		◇	◇		**Renewal of oil:** • Turn off High Pressure Cleaner. • Cool down the engine before oil change. • Loosen bolt(Hex) at bottom of pump housing. • Drain oil into a waste oil-tray. • Tighten bolt(Hex) • Add oil through pump inlet on top of the pump until the red point of the oil control glass has been reached. ***Notice:*** *Do not dispose of used oil in drain.*
Change engine oil) **Recommended Oil :** SAE 15W40 **Usage :** Approx. 13.5L of oil where applicable**		◇	◇		• Turn off High Pressure Cleaner. • Cool down the engine before oil change. ***Notice:*** *Do not dispose of used oil in drain.*
Cleaning of machine	◇			◇	• Use a damp cloth to wipe the machine Do not use detergent cleaning chemicals. • To prevent electrical shock do NOT clean the machine with high pressure. **Notice:** *Do not use detergent cleaning chemicals*
Cleaning of engine fan cover (to ensure sufficient airflow) where applicable**			◇	◇	• Clean the motor fan cover. • Clean the motor fan blade. **Do NOT operate the machine with damaged or removed fan cover.**

Do`s & Don't`s

Do	Don't	Action	Cause
	◇	Spray directly onto the machine with high pressure water	Electrical shock may occurs
	◇	Operate the machine with damaged or removed fan cover	Engine will be overheated and malfunction
	◇	Block the engine air in takes	Engine will be overheated and malfunction
	◇	Operate/keep machine with frost built up	Flush pump with antifreeze fluids before use.
◇		Check hose and cord are not vehicle run over by heavy or squeezed in door opening	May cause machine not function properly.
◇		Check high pressure hose for wear and cracks	To prevent electrical shock and safety to the user
◇		Ensure coupling parts free of dirt to ensure long life of O-ring seals preventing water leaks.	Extend life span of the pump seals and maintaining correct pressure.

Troubleshooting

Symptom	Rectification
Engine/ Electric motor will not start.	• Check power/ battery supply • Low water level in tank. Level switch in water tank is stuck. • Shake level switch in water tank • Pressure switch on booster pump line is stuck. • Fan belt is broken. Replace fan belt* • Battery is flat. Charge battery.* • Fill up water tank through the correct inlet. • Dismantle and lubricate pressure switch with silicone grease. ** diesel engine model variant*
The engine cannot pull the load at start up(for engine model)	• Allow engine to warm up without load. (Disconnect hose and gun).
The pressure drops and the UHP works irregularly. No booster-pump pressure	• The pre-filter on the water tank is clogged. • Or the water supply from the tap is insufficient. • The twin booster pump filters are clogged. • Air in the booster-pump. • Flush the pre-filter. • The machine should always suck from the water-tank. • Replace both filter cartridges. • Repair the booster pump.
The UHP is running at high pressure when trigger is released.	• This is normal when running two-gun operation. • One gun operation. Un-loader valve is stuck. • Inspect clean and repair the un-loader valve seat and pin.
The UHP does not reach the proper working pressure when the spray-gun handle is activated.	• Leakage from: un-loader valve, hose connections, trigger-gun. • Inspect/repair the un-loader. • The pump sucks air. The high-pressure nozzle is worn. • Plunger packings worn out. Change packings. • Turn off the UHP. Inspect for leakage. Replace the nozzle.
The UHP works with approximately 2/3 of the maximum pressure, and the high-pressure hose is vibrating	• There is dirt in the valves. • Turn off the Water-blaster. Dismantle cylinder assembly • Remove the dirt • Check to ensure the inlet valve discs and the discharge valve pins are movable and fit tightly.
Excessive water leakage shooting out from the back of the cylinder assembly.	• Packing is worn out. Replace packings.
Noisiness	• The pump sucks air. • One or more valve springs are broken or down. • Extraneous matter in the valves. • Inspect the low-pressure water supply. Replace springs. • Clean the valves
Water in the oil	• The Oil-seal is worn out. High moisture in the air (condensing inside the crankcase). • The seals are completely worn out. • Check or replace the oil-seals. • Renewal of the crankcase oil more often. • Replace the seals.

NOTE

For any further inconveniences, not mentioned in this user guide or any damages of the machine, we strongly suggest you to make contact with your dealer for the repair or possible replacement of any original spare parts.

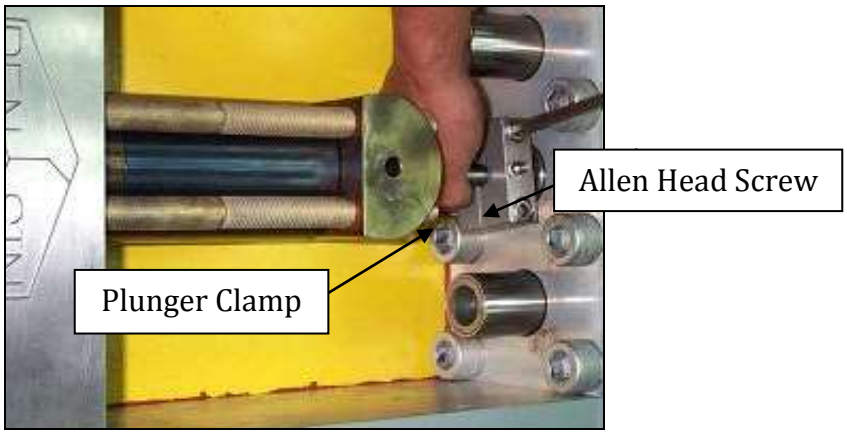
Pump Service & Repair Instructions

Inspection and replacement of valves and high-pressure plunger packings:

Disassembling*:*

1) Disconnect the – cable from the battery and drained all water from the water tank. Remove the spray cover (700680066).

2) Loosen the Allen head screw (700510181) located at the top of the plunger clamp (700680114).



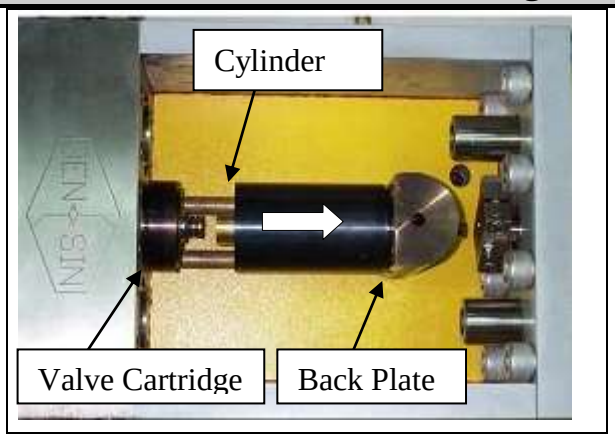
IMPORTANT: AVOID KNOCKING THE PLUNGER AGAINST ANYTHING.

3) Gently free the plunger (700680111) from the clamp (700680114) and push the plunger (700680111) slightly into the cylinder(700680061).

4) While pushing, take care not to knock the tip of the plunger (700680111) against the valve pin (700680056).

5) Loosen the tie bolts (700680054/700680053) in an even and alternating manner. Remove the top 2 screws (700680053) completely and push back the lower 2 (700680054).

6) Slide the back plate(700680084) and cylinder(700680061) backwards to remove the valve cartridge assembly(700680068).



7) Slide the cylinder (700680061) forward; ensure that the plunger(700680111) is clear of the back plate (700680084) before lifting and removing the cylinder (700680061).

8)Once outside, pull out the plunger (700680111) from the back of the cylinder(700680061). Inspect the plungers for scratches, grooves and pitting replace if necessary.

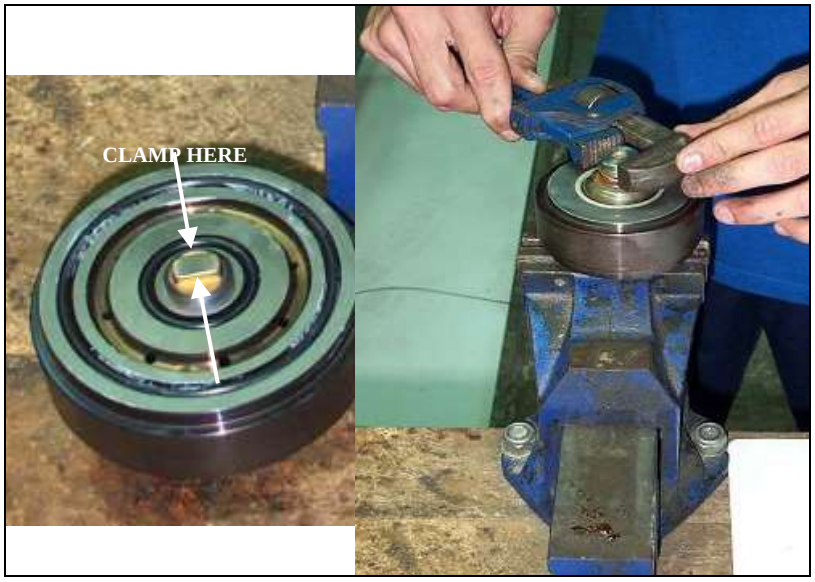
9) Remove the Throat bushing (700680007) and packing spring (700680059) from the front but leave the packing adaptor (700680008) inside the cylinder (700680061).

10) Knock out the remaining packing assembly (7006800053 7006800113 700680032 700680008) with the packing removing tool (Order part no: 700953510) or with a piece of plastic rod or suitable piece of round wood from the front of the cylinder.

11) Inspect the throat bushing(700680007) packing adaptor (700680008), back-up ring (700680005) and support ring(700680110) for wear, replace if necessary. Packing (700680110; 700680032) should be replace with every dismantling

12) Inspect the 3 O-rings (700680049, 700680013 & 700680060) on the valve cartridge (700680068) for wear and tear, replace if necessary.
Inspect that the valve spring (700680058) is not broken, replace if necessary.

13) If valve spring is broken or valve wear is suspected place the valve cartridge on a vice. Clamp on the flat part of the discharge valve-pin (700680056) and carefully unscrew the valve stop nut (700680021) with a suitable spanner or pipe wrench



14) Inspect the suction valve disc (700680057) for wear and pitting. Replace if necessary. Temporary field repair of the suction valve-disc can be carried out by sanding it with fine emery-paper on a flat surface.

Reassembling:

If possible keep the parts as clean as possible and apply some silicone grease (Silicon grease can be ordered as part no.: 700953008) to the parts before assembly for easy assembly.

To assemble the valve cartridge
1) Clamp the valve and valve cartridge on a vice. Position the valve disc(700680057) and spring (700680058) before applying a drop of "Lock-tite" onto the thread of the discharge valve-pin (700680056). Do not apply excessive force when tightening the valve stop nut (700680021), but make sure the nut is screwed on completely.

2) Apply some silicone grease to the O-rings (700680049, 700680013& 700680060) to prevent them from falling off during assembly.

To assemble the cylinder
1) Silicone grease can be applied to parts for easy assembly.
From the rear of the cylinder insert the back-up ring (700680005) with its chamfered side facing the rear.

2) Position and align the support ring (700680110) before pushing it into the cylinder, **do not** forcefully knock the support ring into position.

3) From the front of the cylinder, insert the white packing (700680011). Using the packing adaptor (pos: 26) as adaptor, gently knock the packing into the cylinder with a mallet. Use the special tool (Order part no: 700953510) or a clean plastic rod, gently knock the packing into the cylinder until the packing is touching the backup ring.

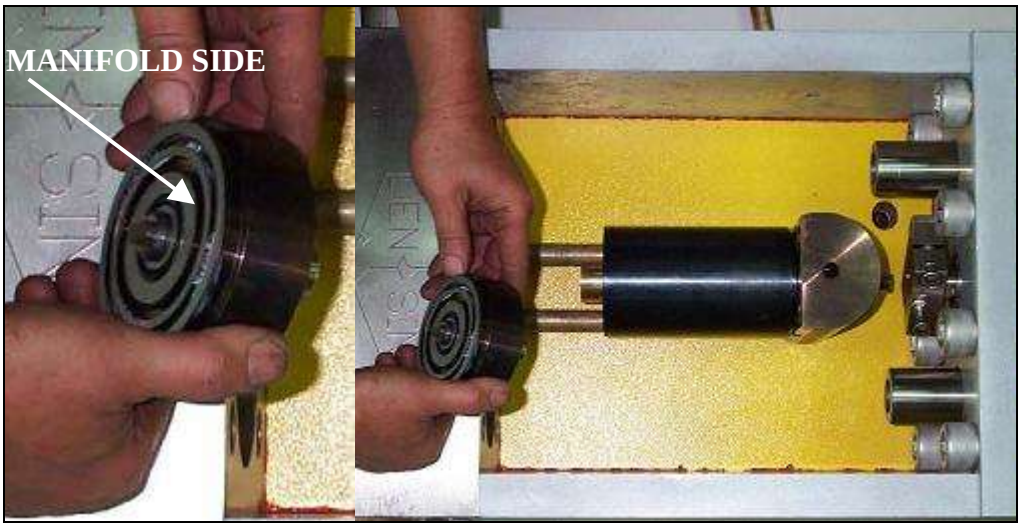
4) Repeat the procedure for black/gold packing (700680032).

5) With the packing adaptor still inside the cylinder, slide the packing spring (700680059) into the cylinder.

6) With its thin walled side facing the front of the cylinder, slide the throat bushing (700680007)

7) Turn the cylinder over and push in the plunger (700680111) from the rear. .
DO NOT KNOCK THE PLUNGER INTO THE CYLINDER.

To prevent against corrosion and ceasing of the tie bolts (700680054/700680053), copper-slip (order part no.: 700953015) should be applied to the threaded region of the tie bolt.



8) Assemble the bottom/ longer tie bolt (700680054) and the back plate (700680084). Ensure that the hole is facing upward.

9) Slide the cylinder with the plunger into the back plate. A portion (at least 2cm) of the plunger should be protruding out of the pack plate. Ensure that the cylinder is properly sited in the step of the back plate before proceeding.

10) Push in the throat bushing (700680007) and insert the valve cartridge assembly (700680068). Ensure that the valve cartridge assembly is properly sited in the step of the manifold. Ensure that the 3 O-ring did not fall out during installation.

11) Install the top/ shorter tie bolt (700680053).

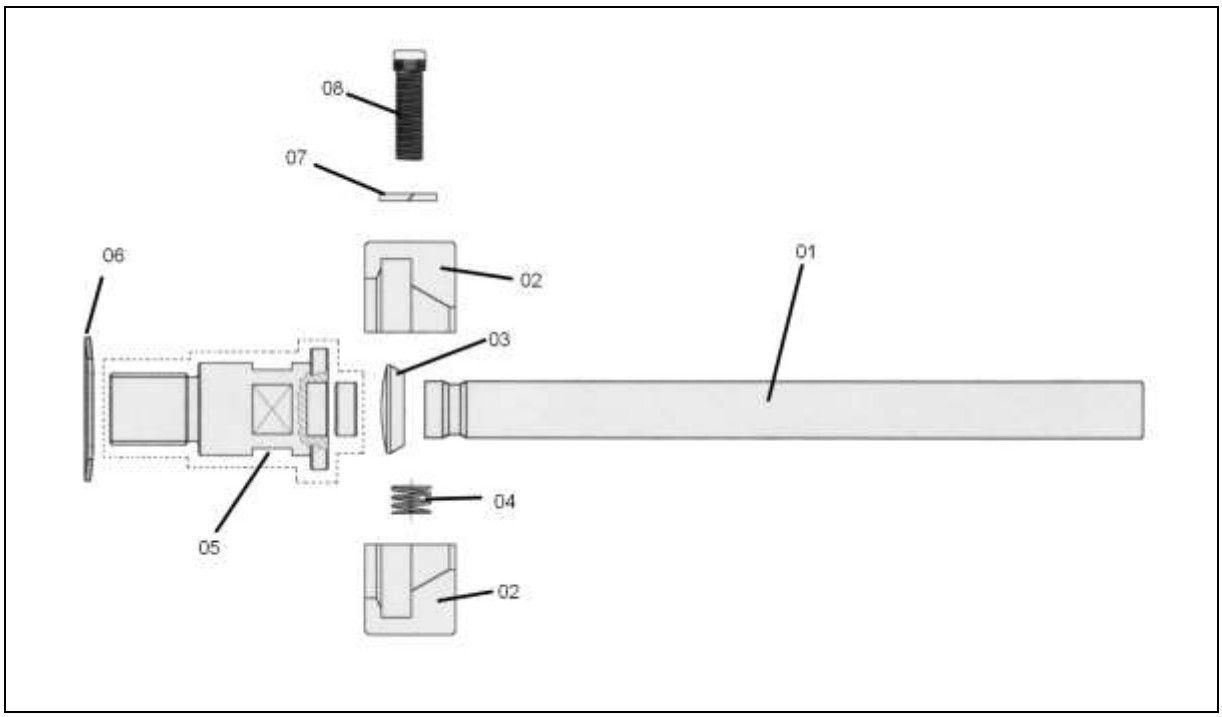
12) Lightly hand torque the tie bolts in an alternating manner until the whole cylinder assembly is correctly seated in its place.
SERIOUS DAMAGE MAY OCCUR IF THE CYLINDER AND VALVE CARTRIDGE ASSEMBLY IS NOT SEATED PROPERLY.

13) Tighten and torque the tie bolts in a star configuration, the bolts should be torque to the correct value in 3 increasing steps.

14) Pull the plunger (700680111) toward the floating clamp and tighten the Allen head screw (700510181) located at the top of the plunger clamp. Grease the floating clamp (700550977) through the greasing nipple located at 700540695 with silicone grease. **DO NOT CRANK THE ENGINE, OR TURN THE ELECTRIC MOTOR TO MOVE THE CLAMP FORWARD**.** If required, the plunger adaptor (700680112) can be loosen to move it forward. It is important that the plunger adaptor be fully tighten; any excess length may cause the plunger to knock against the valve pin.

15) Crank the engine **while depressing the stop button, or turn the motor **coupling by hand carefully. This is to ensure that the plunger clamp & the plunger is coupled tightly, the seals are properly seated and is not binding the plunger.
Finish the procedure by mounting back the spray cover.
*** Diesel or electric model versions*

Inspection And Replacement Of Floating Plunger Components



Floating plungers clamps parts list

Pos	Part/No:	Qty:	Description:
01	700680111	1	Carbide Plunger Ø5/8”
02	700550977	1	Plunger Clamp assembly (consists of pos. 2,7 & 8)
03	700680113	1	Thrust Disc
04	700540447	2	Opening Spring
05	700680112	1	Plunger Adaptor
06	700680115	1	Belville Disc Spring
07	700510185	2	Spring Washer Ø10
08	700510181	2	Screw M10x40

Inspection / Service:
Always stop the pump entirely before inspection and service are carried out.

The self-aligning plunger assembly is designed to work with a light tension from the Belville Disc Spring.

Inspect daily to ensure that the assembly has enough tension to maintain the self-alignment.
By hand: Try to turn the Plunger Clamp around the axis, resistance should be felt. If the Plunger Clamp turns very freely without any resistance at all, or even have slack, dismantling and inspection of the Belville Disc Spring and the Thrust Disc must be carried out. If there is evidence of wear replace the worn parts.
In order to ensure correct self-aligning to take place during operation, the assembly must be kept lubricated with grease at regular intervals. Do not use copper grease.

THE CARBIDE PLUNGER MUST BE HANDLED WITH CARE AT ALL TIMES.
Carbide Plunger is very long lasting, it is a very hard and strong material, it is in danger of chipping if exposed to sharp blows.

Dissembling Of Plunger Clamps:

1) Loosen the two Screws, M10x40 (pos: 08), until the Plunger Clamp is loose enough for the Plunger can be pushed out freely. It is not necessary to dismantle the plunger clamp entirely.
2) To remove Beville spring, unscrew the Plunger Adaptor (Pos: 05) from the Pony rod.

Reassembling of Plunger Clamps:

1) Mount the Belville Disc spring (pos: 06) over the Plunger Adaptor (pos: 05)

TAKE NOTE OF DIRECTION OF THE BELVILLE SPRING:
When the Belville Disc Spring is mounted in the correct way it will give a calculated tension to the plunger assembly allowing for self-alignment.
The inner diameter must face the recess on the Plunger Adaptor, the flared outer diameter must face towards the threaded end of the Plunger Adaptor.
2) Place the Thrust Disc (pos: 03) in the Plunger Clamp (pos: 02) the curved side facing towards the Plunger Adaptor, the tapered sides aligned with the inside taper of the Plunger Clamp.
3) Lubricate the parts well with grease. (Do NOT use copper grease).
Screw the plunger adaptor (pos: 5) back into the pony rod.
4) Assemble the plunger clamps, reseat the plunger and tighten the M10 screw (Pos: 08)
5)Tighten the M10 screw (Pos: 08) to the specified torque.

*Repeat the above steps for the remaining two plungers.

Torque specifications:

Cylinder head securing screws	450 Nm (45 kgm) (300 lbs.ft)
Plunger clamping screws	20 Nm (2 kgm) (15 lbs.ft)
Connecting rod securing screws	68 Nm (6.8 kgm) (50 lbs.ft)
Main bearing cap screws	570 Nm (57 kgm) (420 lbs.ft)

Tumble Box Service & Repair Instructions (Dual Mode Functions)

Replacement of cartridge

The replacement of the cartridge (Part No.: 700540484) is necessary when;

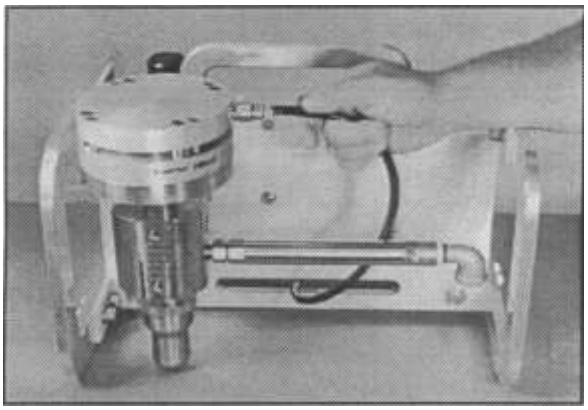
1 there is a significant decrease in working pressure and water is leaking out from the diffuser tube while the unit is in the "working" mode.

2 water is leaking out from the gun side while the unit is in the "idling" mode, excessive leaking will constitute to a safety hazard.

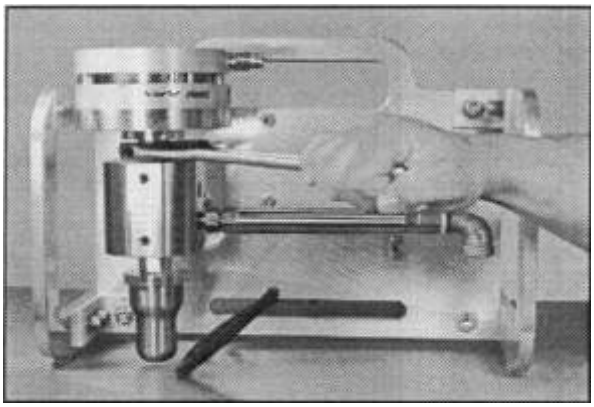
There will be no decrease to the working pressure if water leaks from the gun side while the unit is in the "idling" mode.

Removal procedure of the cartridge

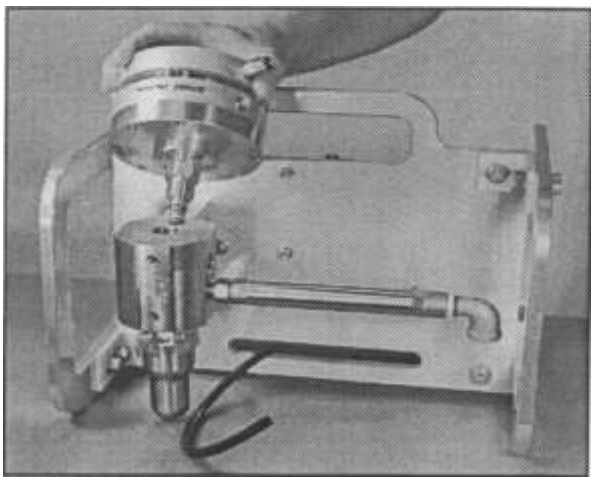
Step 1
Disconnect the QD from the Air Actuator.



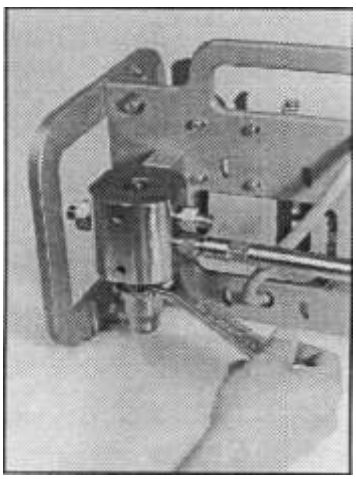
Step 2
Use a crescent wrench turning in a counter
clockwise rotation to loosen the valve.



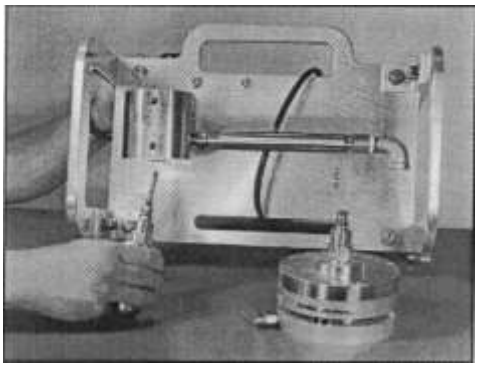
Step 3
Turn by hand to release the cartridge from the
block. The seat end of the cartridge will come
out of the block. The valve will remain in the block until the lower end cartridge seat is removed.



Step 4
Use a crescent wrench turning in a clockwise rotation to loosen the spring housing, then turn by hand until the lower end of the valve comes out of the block.

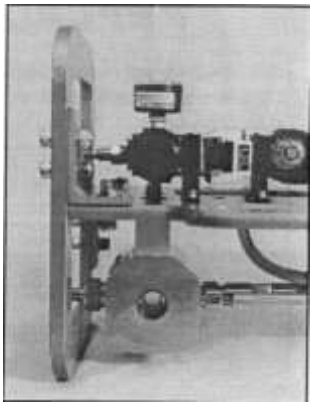


Step 5
Tilt the Tumble Box and continue turning by hand to release the valve and seat from the bottom of the block. This exposes the lower end of the cartridge assembly.

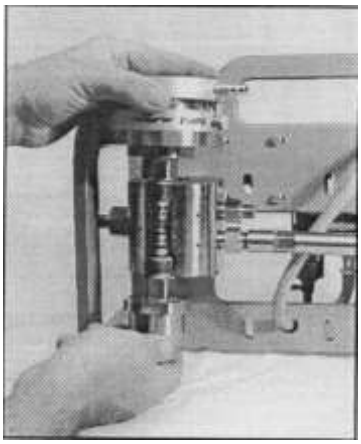


Step 6
Turn the seat to remove it from the Actuator Adapter. This is also done on the Spring Adapter.

Step 7
Inspect and clean the valve block bore with a clean rag. Do the same to the Actuator Adapter and Spring Adapter copper coated threads.

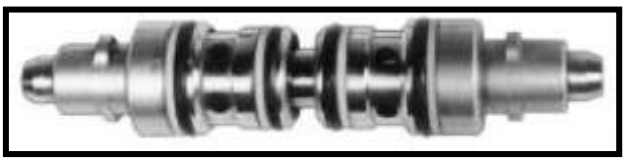


Step 8
Showing the assembly as it would appear inside the block.



Major service kit for tumble box dual Mode)
(For Pressures to 40,000psi)

Pos:	Part no.:	Qty.:	Description:
36	700540484	1	Cartridge (Rep kit valve tumble box dual mode)



700540484

Maintenance scheduling-must acknowledge that equipment and components wear out during jetting operations. Nozzles, valves, hoses and fittings must be regularly examined to assess their fitness for service. Nozzles, holders and connectors must be examined for damaged threads*, cracks and general wear, and replaced as needed. Valves must be disassembled and inspected for wear and corrosion, and repaired or replaced when necessary. This is particularly important for Control Valves (hand guns & foot guns) which must be kept clean and in good condition to minimize the risk of malfunction. Hoses and their connections and fittings must be thoroughly inspected after **EVERY** job, and/or at the end of each shift. Inspect the hoses periodically during operation of the equipment to make sure there is no damage.

***NOTE**: Many components used in water jetting systems are made of stainless steel and can be easily gall and seize during the make up of joints. Threads must be protected by use of Teflon™ tape and the use of a high quality anti-seize compound.

Major service kit installation

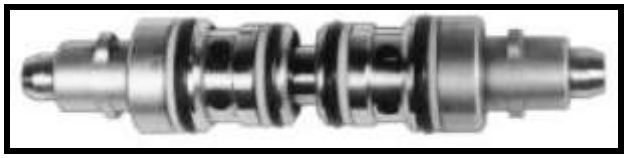
The periodic replacement of the Cartridge, Guide Tube, Jet Impact Slug and Nozzle will be necessary when water begins leaking from the dump side of the Tumble Box while blasting which will cause loss of flow through the gun. These parts receive the heaviest wear. While every precaution has been taken in designing and manufacturing the Tumble Box for ease of operation and maintenance, certain procedures are required:

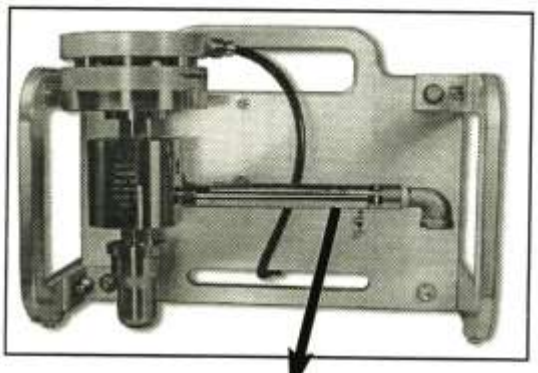
It is recommended that frequent checking of Guide Tube, Jet Impact Slug and Nozzle in the end of the Dump Tube for signs of wear, and anti-seize lubricant must be applied to all threaded connections during reassembly to prevent undue wear. Any NPT threads must have Teflon™ tape as well as anti-seize lubricant. This affects performance, longevity and the warranty.

Step 1

Shows the components of Tumble Box Major Service Kit

700540484





Step 2

After disassembly, inspect the Guide Tube (Part no. 700540483), Impact Slug (Part No. 700540649) and Discharge Orifice for wear and clean all threads.

Diffuser assembly complete:

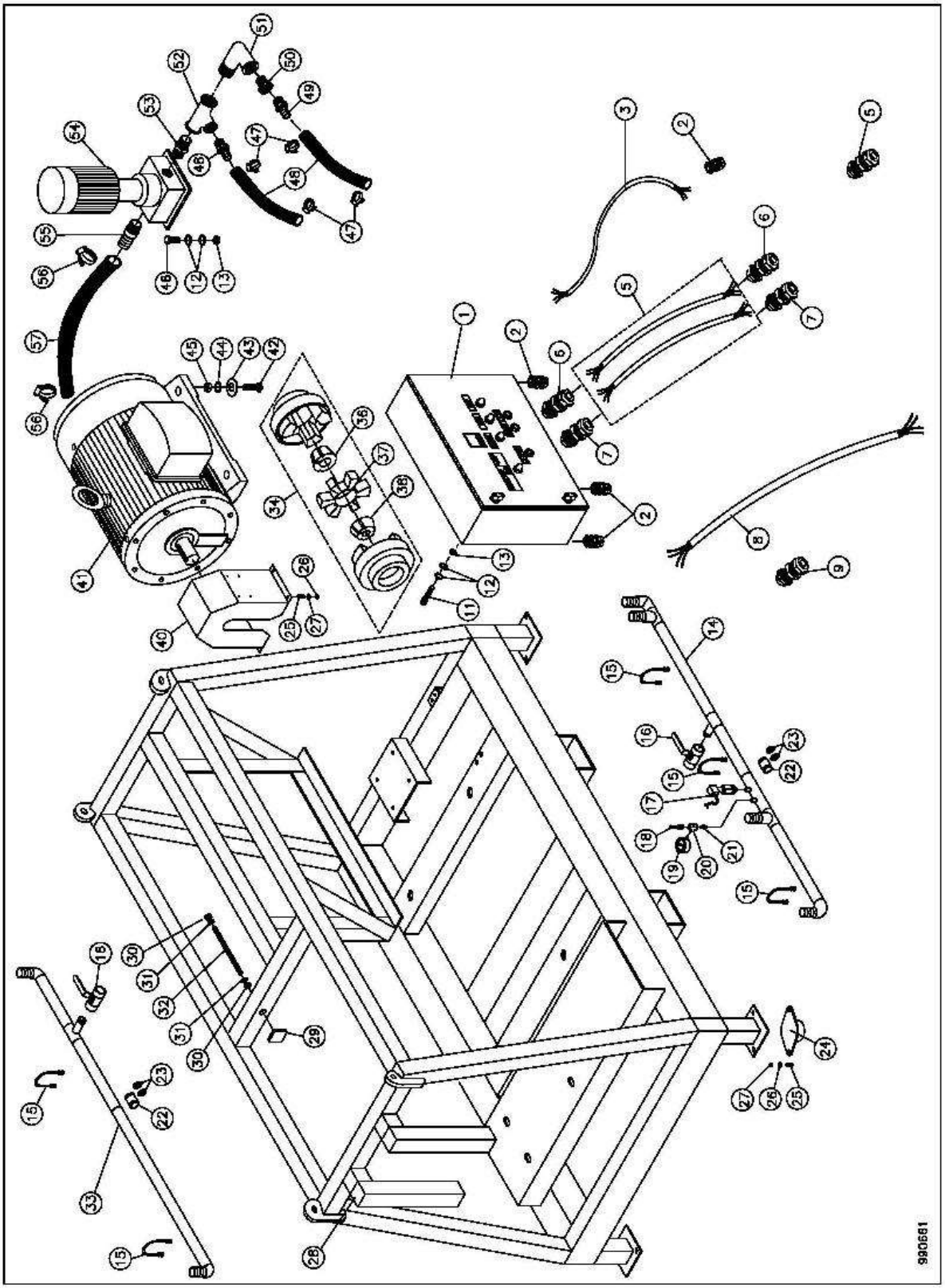
4. Available Accessories

Accessories
Special nozzles
Deck Cleaner
Various valves & connector
Extension hoses in various lengths
Safety gear

Notice: Always state type of Water Blaster along with the part no.: when ordering accessories or spare-parts.

5. Spare Parts List

Main assembly



Main assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700530349	1	El-box complete 50/60Hz
2	700530010	4	Cable gland PG13.5
3	700530363	1	Cable for Booster pump
4	n.a	-	
5	700530360	1	Cable 70mm2 Star Delta Assy
6	700530358	2	Cable gland 4G-50MM2 Ø45MM
7	700530355	2	Cable gland 4G-70mm^2 Ø50MM
8	700530661	10m	Main cable 95mm^2 Complete
9	700530659	1	Cable gland 95mm^2
10	n.a	-	
11	700510041	4	Bolt M10x20
12	700510006	16	Flat washer M10
13	700510008	8	Locknut M10
14	700520675	1	Discharge pipe set
15	700510130	5	U-bolt 1.1/2”
16	700540266	2	Ball valve 1”
17	700540711	1	Pressure Switch Connector
17	700530460	1	Pressure Switch Socket
18	700540292	1	Hose nipple 1/4”
19	700540306	1	Low-Pressure gauge
20	700540140	1	T-joint 1/4”
21	700540307	1	Nipple 1/4”
22	700520224	2	Connection Suction/Discharge pipe sets
23	700600203	4	O-ring
24	700510117	4	Rubber foot
25	700510030	12	Bolt M8 X 25
26	700510005	16	Washer M8
27	700510004	12	Locknut M8
28	700520286	1	Frame
29	700520280	1	Stop for Water-tank
30	700510068	2	Lock nut M12
31	700510067	2	Washer M12
32	700510164	1	Stud bolt M12 X 350
33	700520240	1	Suction pipe set
34	700520103	1	Coupling
35	n.a	-	
36	700520113	1	Taper lock bush 75mm motor side
37	700520333	1	Rubber element
38	700520111	1	Taper lock bush 50mm pump side
39	n.a	-	
40	700520289	1	Cover coupling
41	700530608	1	150HP Motor 50/60Hz
42	700510095	4	Bolt 7/8” x 3”
43	700510056	4	Washer 7/8”
44	700510097	4	Spring washer 7/8”
45	700510096	4	7/8” Nut
46	700510062	4	Bolt M10 x 50

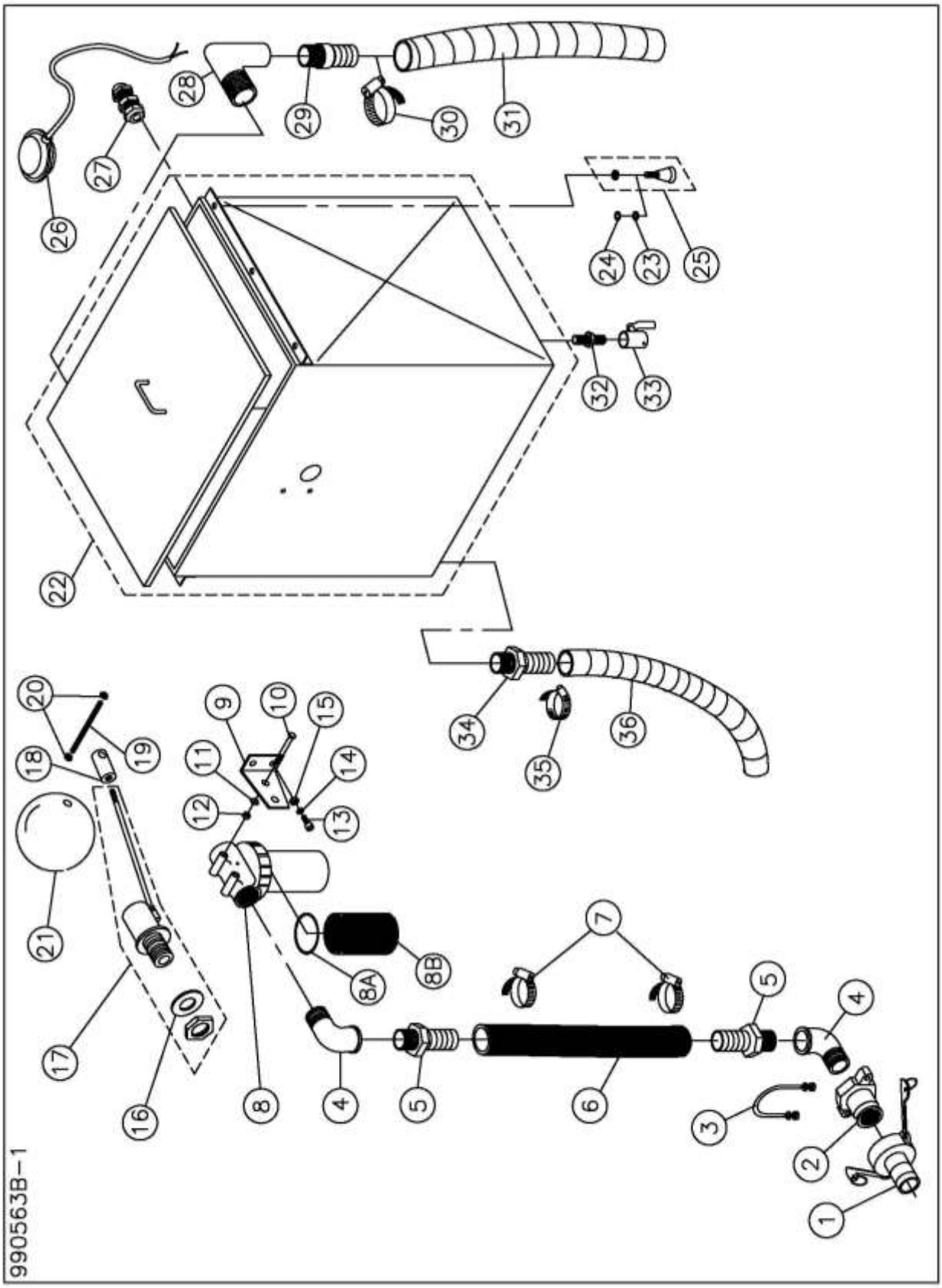
(Continues)

(Continued)

Pos:	Part no.:	Qty.:	Description:
47	700540262	2	Hose clip 1.1/2”
*48	700950025	0.5m	Hose 1.1/2”
49	700540480	1	Hose nipple 1.1/2” – 1.1/4”
50	-	-	-
51	700540950	1	Elbow 1.1/4” 45 Degree
52	-	-	
53	-	-	
54	700530511	1	Booster pump Grundfos 50Hz
54	700530512	1	Booster pump Grundfos 60Hz
55	700540480	1	Hose nipple 1.1/2” – 1.1/4”
56	700540262	2	Hose clip 1.1/2”
57	700520244	1	Suction Hose 1.1/2” x 1000mm

**Not shown*

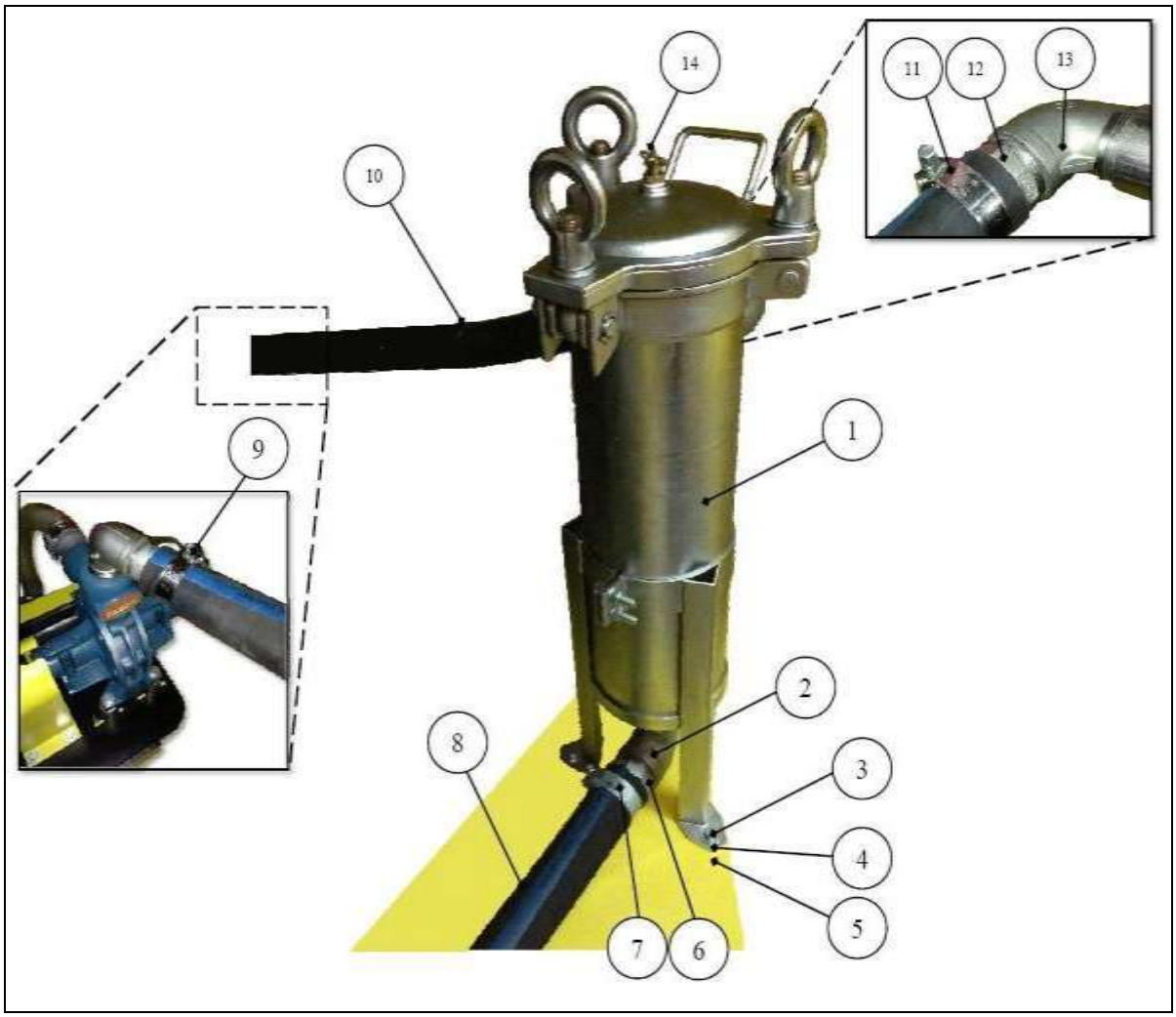
Water tank assembly



Water tank assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700540303	1	COUPLING EVERTIGHT 1½" (HOSE)
2	700540302	1	COUPLING EVERTIGHT 1½" (ADAPTOR)
3	700510130	1	U BOLT M10 1 1/2" ZN
4	700540564	2	ELBOW 1 1/2" MF SS
5	700540565	2	HOSE NIPPLE 1 1/2" SS
6	700520244	1	SUPPLY HOSE 1 1/2" L=1.5M
7	700540262	2	HOSE CLIP DIA 1 1/2" (SUPEREX)
8	700520122	1	FILTER 1 1/2" BSPPF-F COMP+INS
8A	700520123	1	FILTER INSERT "BLUE" 50 MESH
8B	700520201	1	O-RING
9	700520138	1	BRACKET FOR 1 1/2" WATER FILTE
10	700510208	2	BOLT M8 X 120 HEX ZN
11	700510005	4	WASHER FLAT M8 8.5/18MM X 1/16
12	700510004	2	LOCKNUT M8 ZINC COATED
13	700510107	2	BOLT M8 X 20 HEX ZN
14	700510005	2	WASHER FLAT M8 8.5/18MM X 1/16
15	700510004	2	LOCKNUT M8 ZINC COATED
16	700540273	1	DOWTY SEAL 1 1/2"
17	700520135	1	FLOAT VALVE 1 1/2" W/O BALL
18	700520052	1	BALL HOLDER DOUBLE FOR FLOAT V
19	700510166	1	STUDBOLT M8 X 80 SS
20	700510057	2	NUT M8 ZN
21	700520136	2	BALL 6" FOR FLOAT VALVE
22	700520236	1	WATER TANK UHP
23	700510005	6	WASHER FLAT M8 8.5/18MM X 1/16
24	700510034	6	WASHER SPRING M8 ZN
25	700520340	6	RUBBER DAMPENER Ø32x24 M8x20
26	700530145	1	FLOAT SWITCH REGULATOR EL W3.
27	700530010	2	CABLE GLAND PG 13.5
28	700540564	1	ELBOW 1 1/2" MF SS
29	700540565	1	HOSE NIPPLE 1 1/2" SS
30	700540262	1	HOSE CLIP DIA 1 1/2" (SUPEREX)
31	700950016	1	SUCTION HOSE 1 1/2" L=1.5M
32	700540479	1	NIPPLE 1" BSPT S.S.
33	700540266	1	BALL VALVE 1" BSP F-F BRASS
34	700540565	1	HOSE NIPPLE 1 1/2" BSPT SS
35	700540262	1	HOSE CLIP DIA 1 1/2" (NORMA) 47-51 SS
36	700520467	1	SUCTION HOSE 1.1/2" X 1M CLEAR

Filter assembly (standard)



**Picture shown diesel variant*

Filter Assembly Part list (Standard)

Pos:	Part no.:	Qty.:	Description:
1	700520713	1	FILTER HOUSING S.S, H.F, BAG w/o BAG
1a	700520714	1	FILTER BAG, WATER 5MICRON
1b	700520715	1	FILTER BAG, WATER 25MICRON
2	700540564	1	ELBOW 1 1/2" MF
3	700510027	3	BOLT M8 X 30 HEX
4	700510005	6	WASHER FLAT M8
5	700510004	3	LOCKNUT M8
6	700540565	1	HOSE NIPPLE 1.1/2" BSPT
7	700540262	1	HOSE CLIP DIA 1 1/2"
8	700950025	0.78m	HOSE Ø1½" RUBBER (BLACK)
9	700540262	1	HOSE CLIP DIA 1 1/2"
10	700950025	0.42m	HOSE Ø1½" RUBBER (BLACK)
11	700540262	1	HOSE CLIP DIA 1 1/2"
12	700540565	1	HOSE NIPPLE 1.1/2" BSPT
13	700540564	1	ELBOW 1 1/2" MF
14	700520697	1	DRAIN COCK ¼”

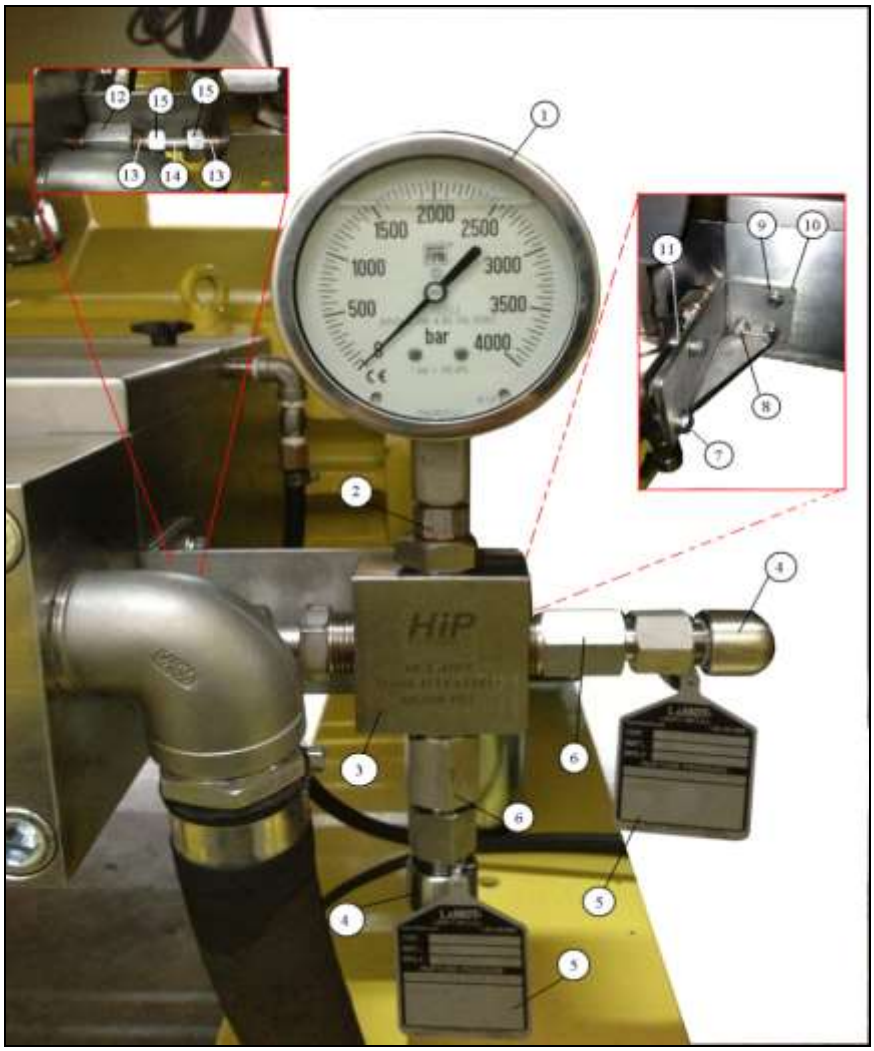
Filter assembly (Optional)

**Picture shown diesel variant*

Filter Assembly Partlist (Optional)

Pos:	Part no.:	Qty.:	Description:
1	700520606	1	Filter Housing S.S c/w filter
2	700540625	2	Bushing 1 1/2" - 2"
3	700540565	2	Hose Nipple 1.1/2"
4	700540262	2	Hose Clip
5	700540564	1	Elbow 1 ½" M-F
6	700540480	1	Hose Nipple 1 ½"-1 ¼"
7	700510063	6	Bolt M10 x 30mm
8	700510006	6	Washer Flat M10
9	700510035	6	Washer Spring M10
10	700510030	4	Bolt M8 x 25mm
11	700510005	8	Washer Flat M8
12	700510004	4	Locknut M8
13	700540878	1	Ball Valve ¾" F-F
14	-	-	
15	700520697	1	Drain cock ¼"
16	700520244	2	Supply Hose
17	700520666	1	FILTER CARTRIDGE 9 3/4" 5uM
18	700540262	1	HOSE CLIP DIA 1 1/2" (NORMA)
19	-	-	
20	700520467	1	SUCTION HOSE 1.1/2" X 1M
21	700520240	1	SUCTION PIPE SET WELDED 1 1/2"
22	700520675	1	DISCHARGE PIPE SET - HIGH FLOW
1-17	**700520674**	**1**	**FILTER HOUSING HIGH FLOW SS COMPLETE**

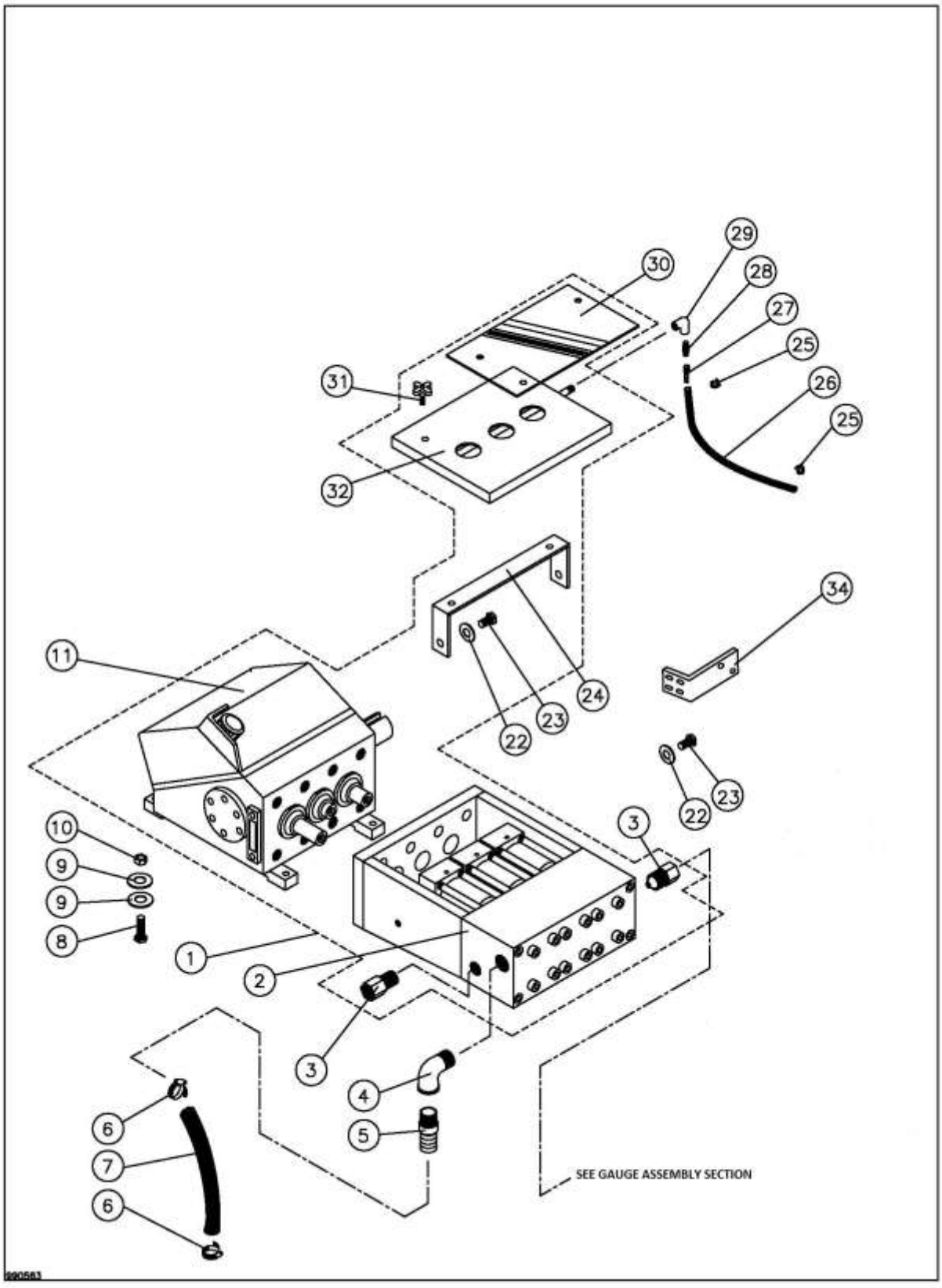
Gauge assembly



Gauge assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700540881	1	PRESSURE GAUGE 4000BAR 4" DIAL
2	700540879	1	SNUBBER
3	700540354	1	CROSS 9/16" 60K PSI W/O C&G
4	700550771	2	MUSHROOM HEAD 3/8" FOR RUPTURE DISC
5	700540392	2	RUPTURE DISC 37000 PSI
6	700540386	2	"SAFETY HEAD 9/16"" 60K S.S." COMPLETE w/o RUP.DISC
7	700510027	2	BOLT M8 X 30 HEX
8	700510030	3	BOLT M8 X 25HEX
9	700510005	5	WASHER FLAT M8
10	700520486	1	SUPPORT F. RUPT. DISC ASS UHP
11	700510044	2	WASHER 8.2/19X7MM
12	700540572	1	ADAPTOR 1.1/8"M- 1.1/8"F 40KP
13	700540388	2	COLLAR 9/16 60K S.S.
14	700540355	1	NIPPLE 9/16" X 4" 40K

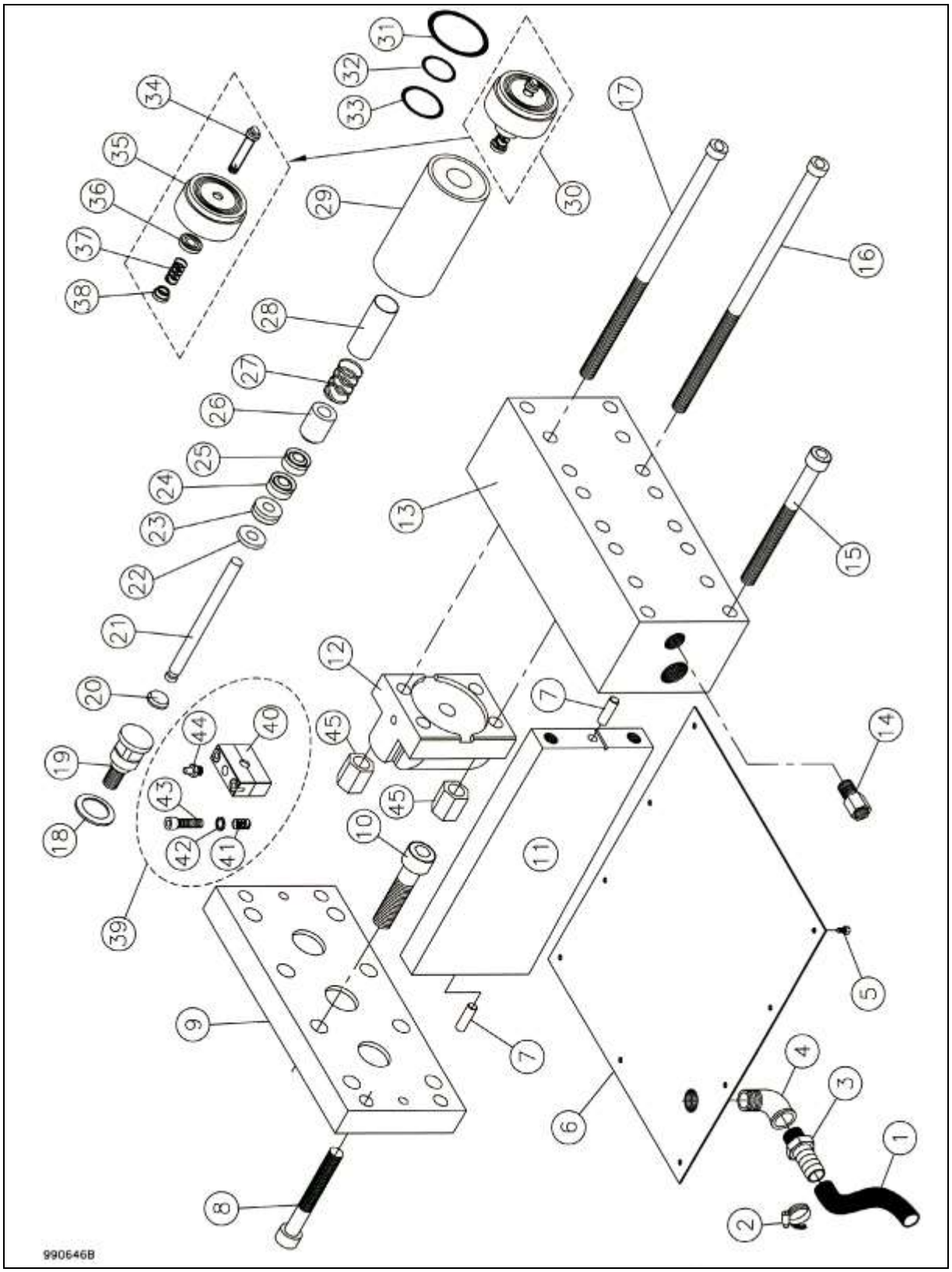
Pump coupling assembly



Pump coupling assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700680104	1	Pump complete UHP 60Hz**
1	700680122	1	Pump complete UHP 50Hz**
2	700680065	1	Fluid end complete 36K Psi w. Outlet fittings 700540572
3	700540572	2	Pump Outlet fitting UHP
4	700540564	2	Elbow 1.1/2”
5	700540565	2	Hose nipple 1.1/2”
6	700540262	4	Hose clip 1.1/2”
7	700520243	2	Inlet Hose 1.1/2” x 0.45m
8	700510080	4	Bolt 5/8”x 2.5”
9	700510081	8	Washer Flat 5/8”
10	700510116	4	Lock Nut 5/8”
11	700650281	1	Pump Power-end 60HZ**
11	700650305	1	Pump Power-end 50HZ**
16	700540477	2	Rupture Disc 37K Psi
16	700540392	2	Rupture Disc 37K Psi
22	700510067	2	Washer Flat M12
23	700510129	3	Bolt Hex M12x25
24	700680067	1	Bracket for Spray-cover
25	700540199	2	Hose clip ¼”
26	700540582	1	Hose ¼” x 1000mm
27	700540268	1	Hose Nipple ¼”
28	700540754	1	Non return valve
29	700540282	1	Elbow ¼”
30	700680109	1	Cover for Cover-Spray
31	700510010	2	Knob Screw M8
32	700680066	1	Spray-cover
34	700520486	1	Support bracket
N/A	700551099	3	Handle for cylinder
N/A	700540739	6	Hose clip for cylinder

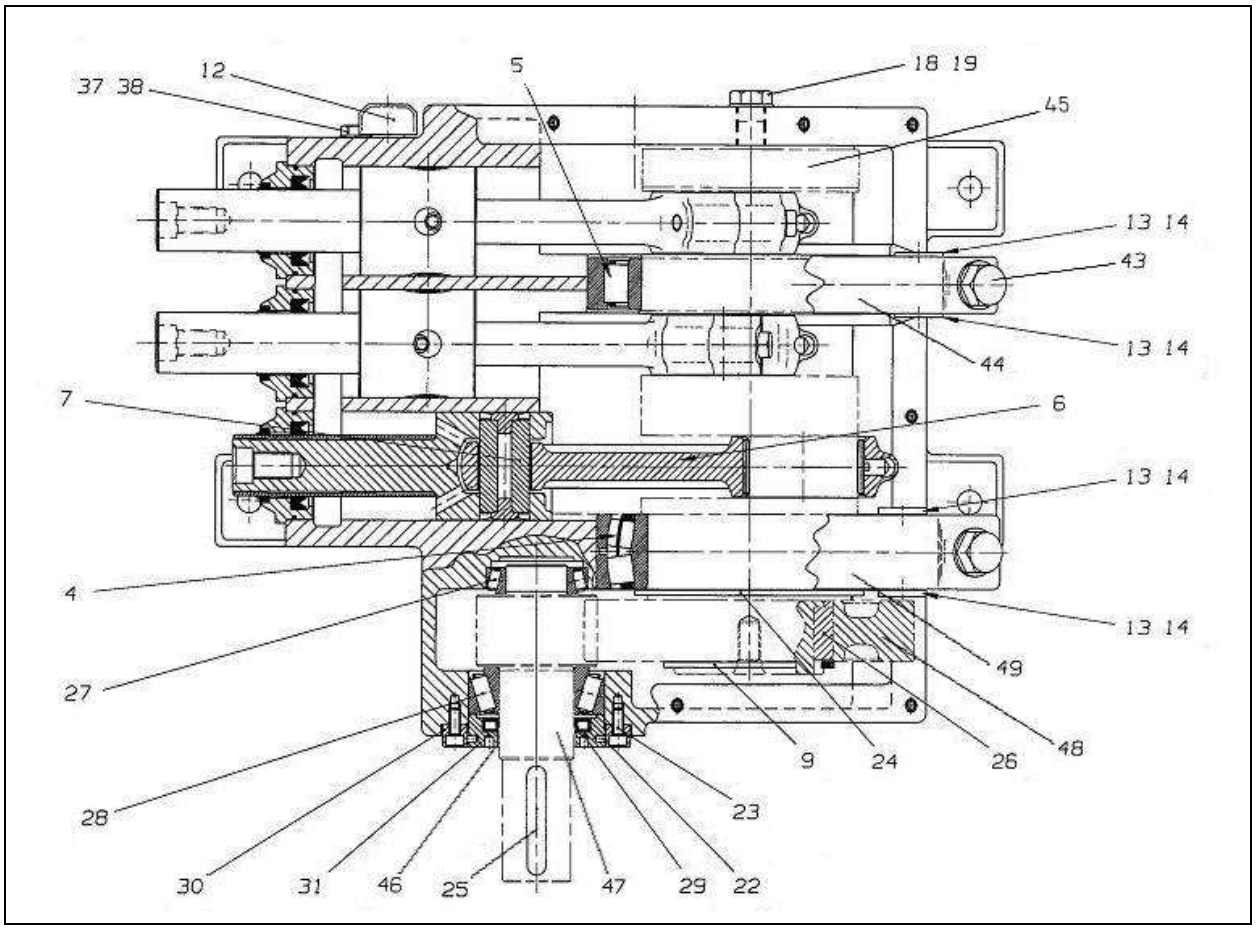
Pump fluid-end assembly

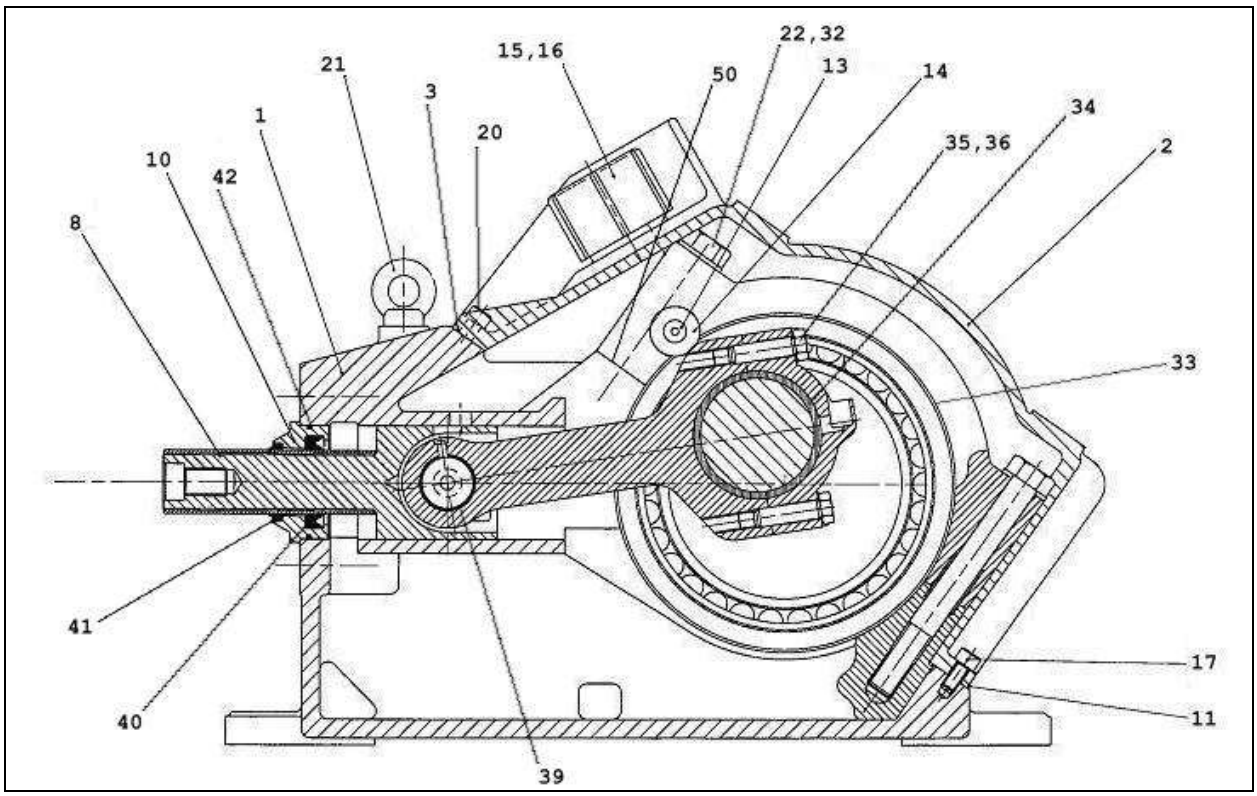


Pump fluid-end assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700520293	1	Hose 1”
2	700540264	1	Hose clip 1”
3	700540245	1	Hose Nipple ¾”-1”
4	700540323	1	Elbow ¾”
5	700510167	9	Bolt M6 x 10 HEX
6	700680096	1	Plate bottom for box for UHP fluid end
7	700510161	4	Dowel pin ø1/2” x1”
8	700510160	4	Bolt ¾” UNC x 3” Allen
9	700680095	1	Plate rear for UHP fluid end
10	700510140	8	Bolt M24 x 80 Allen
11	700680094	2	Plate side for UHP fluid end
12	700680084	3	Back plate
13	700680085	1	Manifold 36 K
14	700540572	2	Outlet fitting UHP
15	700510159	4	Bolt ¾” UNC x 5” Allen
16	700680054	6	Tie bolt 15”
17	700680053	6	Tie bolt 14”
18	700680115	3	Bellville Spring Washer
19	700680112	3	Plunger Adaptor for Floating Plunger AJ
20	700680113	3	Thrust Disc for Floating Plunger
21	700680111	3	5/8” Floating Plunger AJ
22	700680110	3	Ø 5/8” Support Ring
23	700680005	3	Back-up ring for 5/8” - 1.3/8” UHP
24	700680011	3	Packing white 5/8” - 1.3/8”
25	700680032	3	Packing gold 5/8” - 1.3/8”
26	700680008	3	Packing adaptor 5/8” - 1.3/8” AJ
27	700680059	3	Spring for packing, UHP
28	700680007	3	Throat bushing 5/8” - 1.3/8” AJ
29	700680061	3	Cylinder UHP 1.3/8” bore
30	700680068	3	Valve cartridge assembly
31	700680049	3	O-ring manifold end outer
32	700680013	3	O-ring manifold end inner
33	700680060	3	O-ring cylinder end
34	700680056	3	Discharge valve pin
35	700680086	3	Valve cartridge
36	700680057	3	Valve disc suction
37	700680058	3	Spring for valve, UHP
38	700680021	3	Valve stop nut
39	700550977	3	Clamp for plunger UHP complete
40	700680114	3	Clamp for Floating Plunger
41	700540447	6	Spring
42	700510185	6	Spring Washer M10
43	700510181	6	M10x40
44	700540695	3	Grease Nipple
45	700680117	12	Back Plate nut
1-45	700680065	1	Fluid End Complete 36KPsi

Pump power-end assembly part

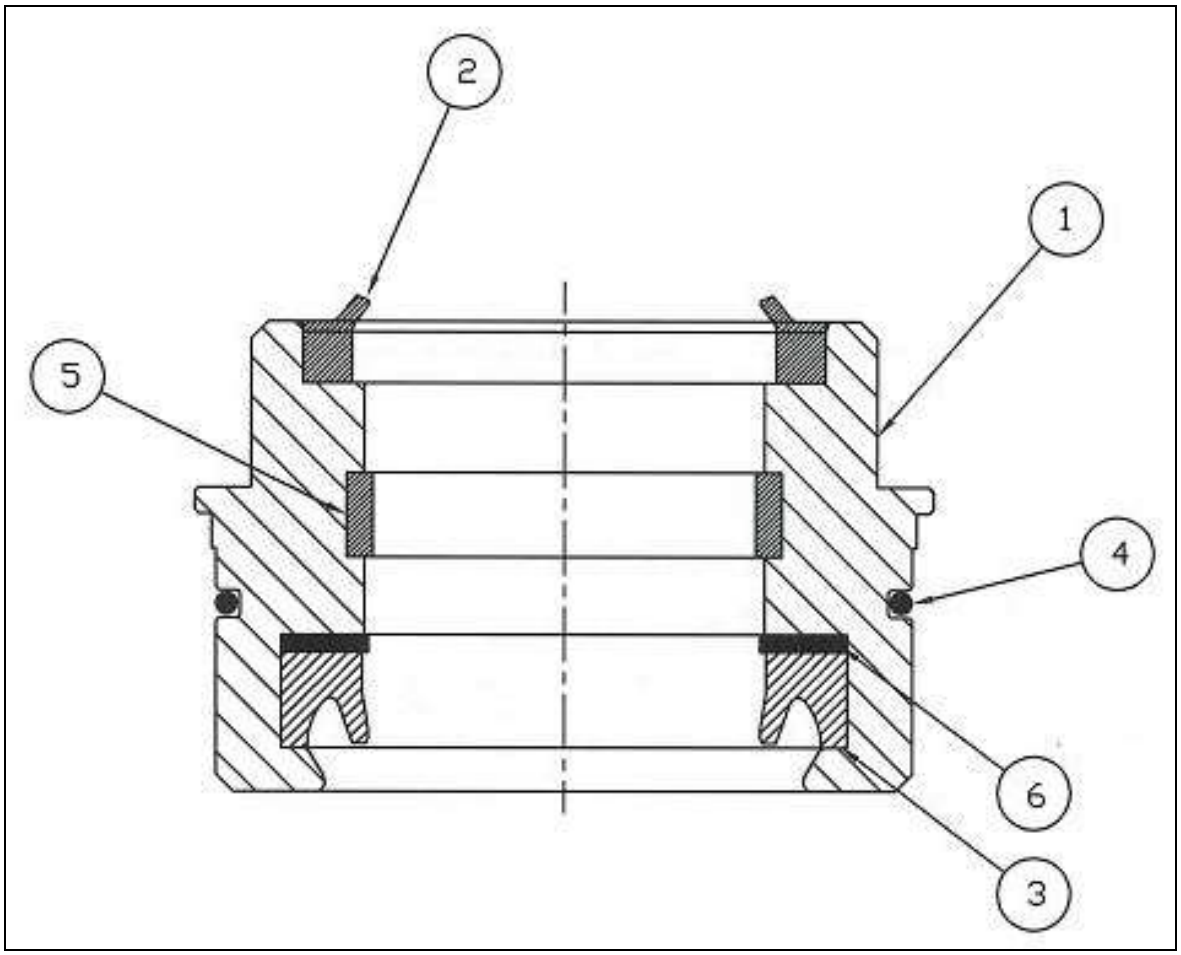




Pump power-end assembly spare-parts list

Pos.:	Part. No.:	Qty.:	Description.
1	700650268	1	Crankcase
2	700650222	1	Crankcase Cover
3	700650034	1	Gasket for crankcase cover
4	700650234	1	Spherical Roller Bearing
5	700650232	1	Cylindrical Roller Bearing
6	700650223	3	Connecting rod and cap Assembly
7	700650088	3	Gudgeon pin Assembly
8	700650285	3	Crosshead & Sleeve Assembly
9	700650237	1	Circlip S150M
11	700650034	1	Gasket for crankcase cover
12	700650059	1	Oil level glass
13	700510009	8	Screw
14	700650273	8	Washer retainer for cap bearing
15	700510003	6	Screw filler cap
16	700520137	1	Filler cap
17	700510218	8	Cap Screw
18	700650113	1	Magnetic drain plug
19	700540056	1	Bonded seal
20	700510157	8	Socket head screw for crankcase cover
21	700650105	2	Lifting eye
22	700650228	4	Tab washer
23	700650106	4	Socket head cap screw
24	700650286	1	Circlip External S110M
25	700650277	1	Key
26	700650278	1	Key
27	700650274	1	Taper roller bearing
28	700650275	1	Taper roller bearing
29	700650240	1	Oil seal
30	700650241	1	Pinion bearing retaining plate
31	700650242	1	Adjustable ring
32	700650229	4	Hexagon head bolt
33	700650245	1	Bearing location strip
34	700650230	3	Big end connecting rod bearing
35	700650113	6	Magnetic drain plug
36	700650112	6	Connecting rod bolt
37	700540097	1	Plug
38	700540314	1	Bonded seal
39	700650087	3	Gudgeon pin bearing
43	700650249	1	Hexagon head bolt
44	700650233	1	Cap
45	700650231	1	Crankshaft
46	700650121	4	Nylon locking slug
47	700650269	1	Pinion gear 3.48:1 60Hz**
47	700650306	1	Pinion gear 2.96:1 50Hz**
48	700650270	1	Gear wheel 3.48:1 60Hz**
48	700650307	1	Gear wheel 2.96:1 50Hz**
49	700650235	1	Cap
50	700650250	4	Dowel
1-50	700650281	1	Power End 60Hz**
	700650305	1	Power End 50Hz**

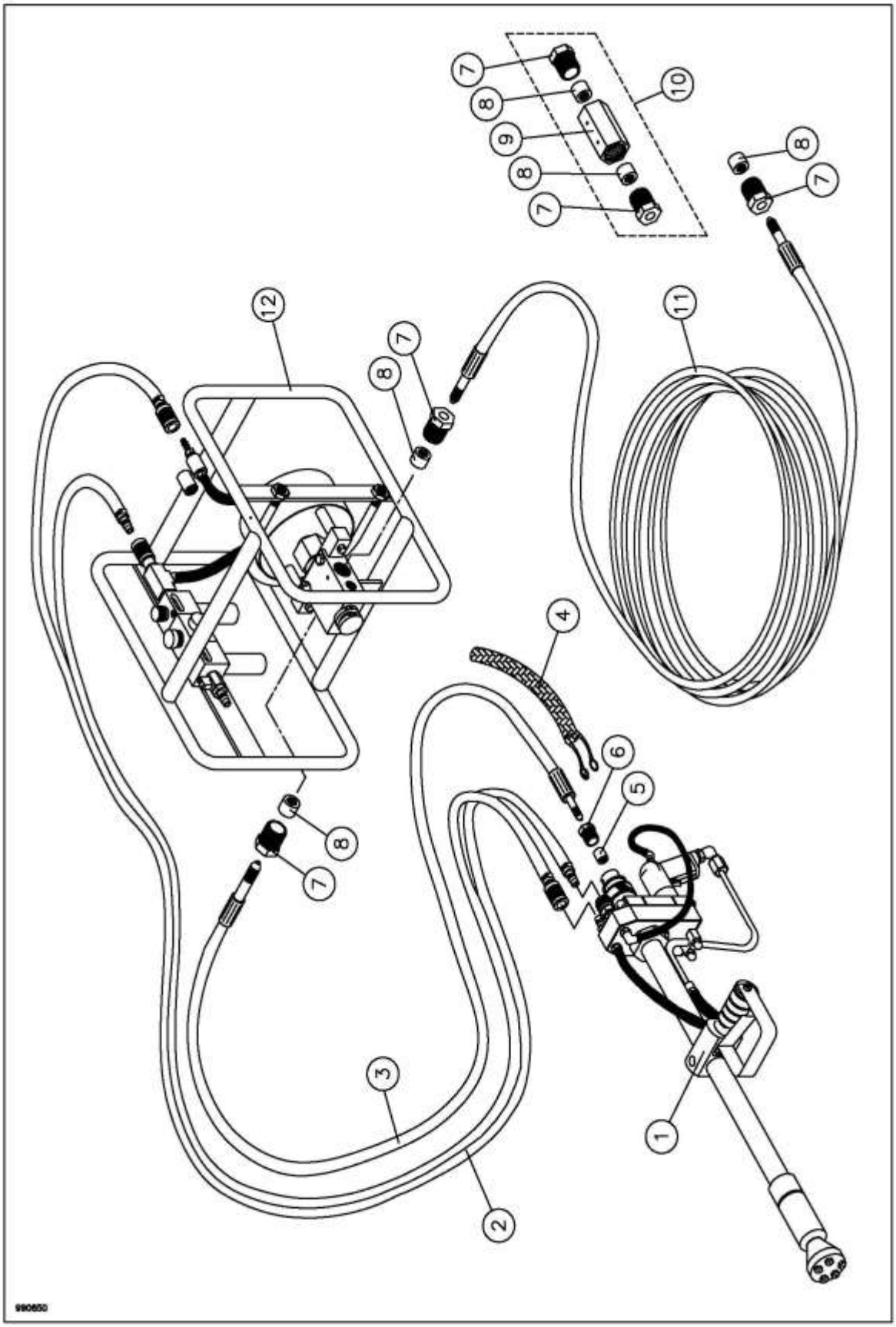
Oil Seal assembly



Oil Seal Assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700650292	3	Oil Seal Housing
2	700650293	3	Oil Seal scraper
3	700650264	3	Seal crosshead oil
4	700650265	3	O-ring
5	700650296	3	Guide Band 45X50X9.7S
6	700650304	3	Spacer Ring Rod Seal
1-6	700650302	3	Oil Seal Assy. 2011

Rotating gun / Hoses / Un-loader assembly



Rotating gun / Hoses / Un-loader assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:	
1	N/A	1	UHP Rotating gun complete	
2	700550810	1	Air-hose double x 7m	(standard)
*3	700550643	1	High pressure hose 9/16" – 3/8" Ø5mm for gun x 7m	(standard)
4	700540393	1	Hose containment safety grip	
5	700540391	1	Collar 3/8"	
6	700540390	1	Gland nut 3/8"	
7	700540387	3	Gland nut 9/16"	
8	700540388	3	Collar 9/16"	
9	700540353	N/A	Straight Connection 9/16"	(Optional)
10	700540378	N/A	Connection straight 9/16" w/ collars & gland nuts	(Optional)
11	700550852	1	High pressure hose 9/16" Ø8mm x 20m 36kpsi	
12	700540568	1	Pneumatic un-loader dump type 36kpsi complete	(standard)

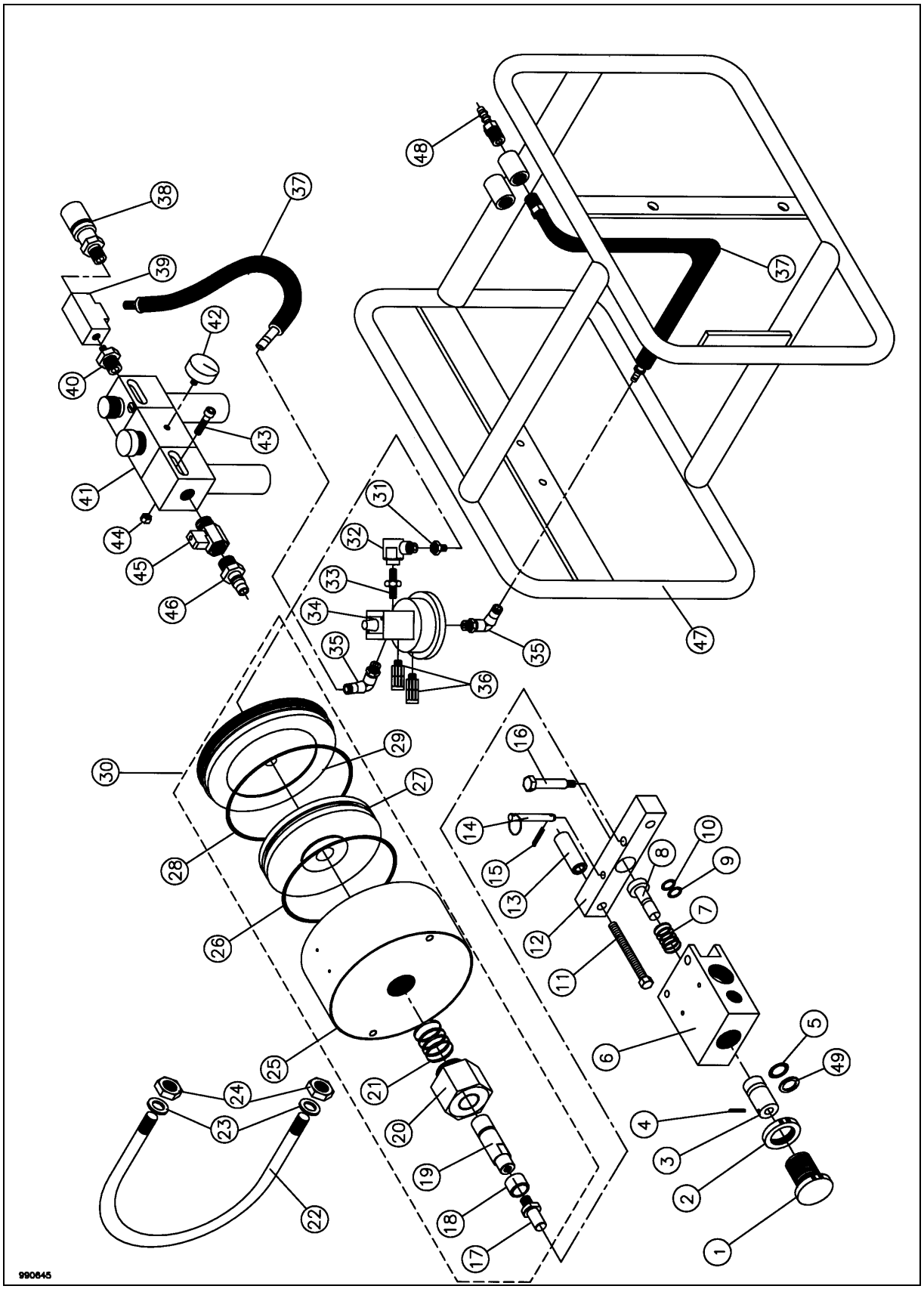
- Dual mode tumble box 700540486
- For Dual mode tumble box replace part no. 700550643 with 700550939

Nozzle Configuration

Part no.:	Qty.:	Description:
700551486	1	UHP Nozzle 0.017
700550680	3	UHP Nozzle 0.018

Note: Above nozzle size may varies according to machine

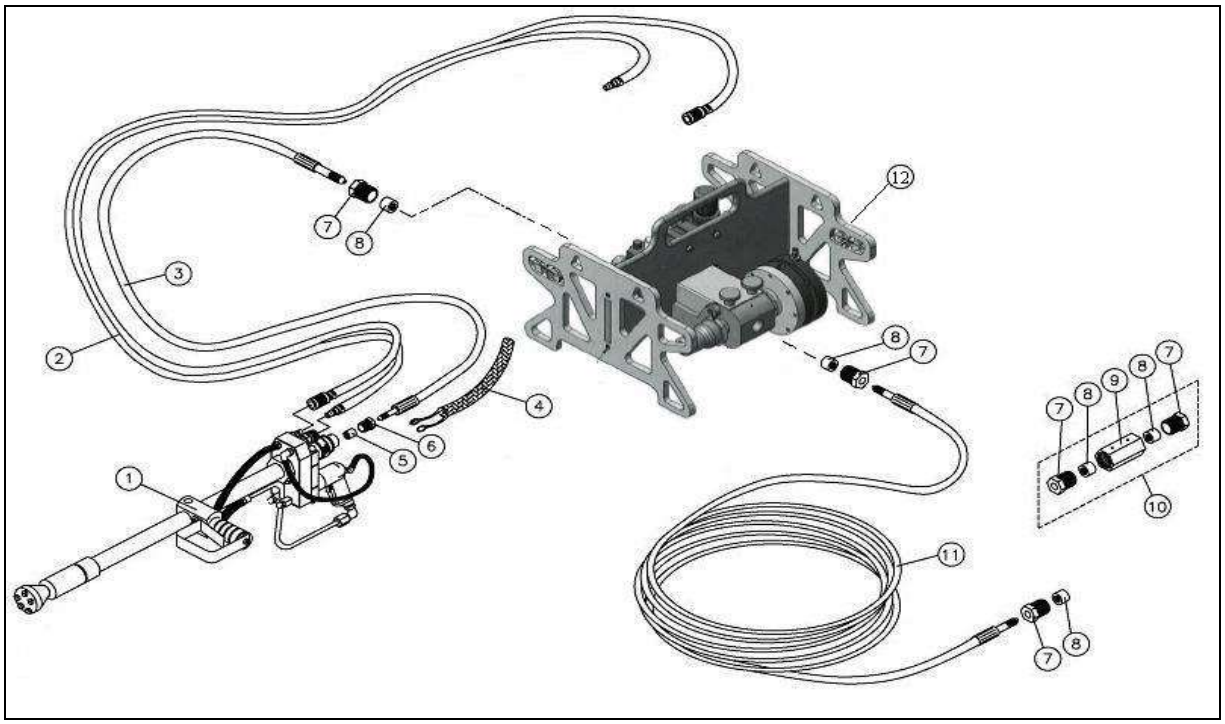
Pneumatic Un-loader / Dump type assembly



Pneumatic un-loader / dump type assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700540521	1	Valve adjust stem
2	700540522	1	Lock nut knurled
3	700540448	1	Valve seat
4	700540523	1	Roll pin
5	700540446	1	O-ring
6	700540520	1	Valve body for tumble box
7	700540447	1	Spring
8	700540518	1	Valve pin
9	700540445	1	O-ring
10	700550128	1	Back-up ring, for valve pin, UHP tumble box
11	700510059	2	Bolt M8 x 70 Hex
12	700540510	1	Cross bar, valve block mounting
13	700540513	2	Distance bushing
14	700540530	1	Retainer pin w/ ring
16	700510155	1	Retainer screw
17	700540514	1	Push rod, air actuator
18	700540511	1	Bearing linear, air actuator
19	700540515	1	Piston rod, air actuator
20	700540512	1	Connector, valve body actuator, special
21	700540539	1	Spring
22	700520281	1	U-bolt
23	700510067	2	Washer flat M12
24	700510068	2	Lock nut
25	700540507	1	Cylinder for actuator, pneumatic un-loader
26	700540524	1	O-ring
27	700540508	1	Piston for air actuator
28	700540525	1	O-ring
29	700540509	1	Back plate for air actuator
30	700540517	1	Actuator complete
31	700540133	1	Bushing ¼”- 1/8”
32	700540535	1	Quick exhaust valve 1/8”
33	700540580	1	Nipple 1/8”
34	700540541	1	Valve block pilot 1/8” - 3/2
35	700550766	2	Air elbow P.L. 1/8”
36	700540542	2	Air exhaust silencer 1/8”
37	700550813	2	Hose connection
38	700540481	1	Air coupling female ¼”
39	700540140	1	T-joint ¼”
40	700540144	1	Nipple 3/8” – ¼”
41	700540532	1	FRL valve (filter / regulator / lubricator)
42	700540475	1	Pressure gauge air 1/8”
43	700510168	2	Bolt M5x55 Allen
44	700510032	2	Lock nut M5
45	700540533	1	Ball valve 3/8”
46	700540583	1	Air coupling 3/8”
47	700540534	1	Frame tubular
48	700540363	1	Air coupling ¼” male
49	700540168	1	Back-up Ring
1-49	700540568	1	Pneumatic un-loader complete (dump)

Air Operated Rotating Gun Assembly (Dual Mode)



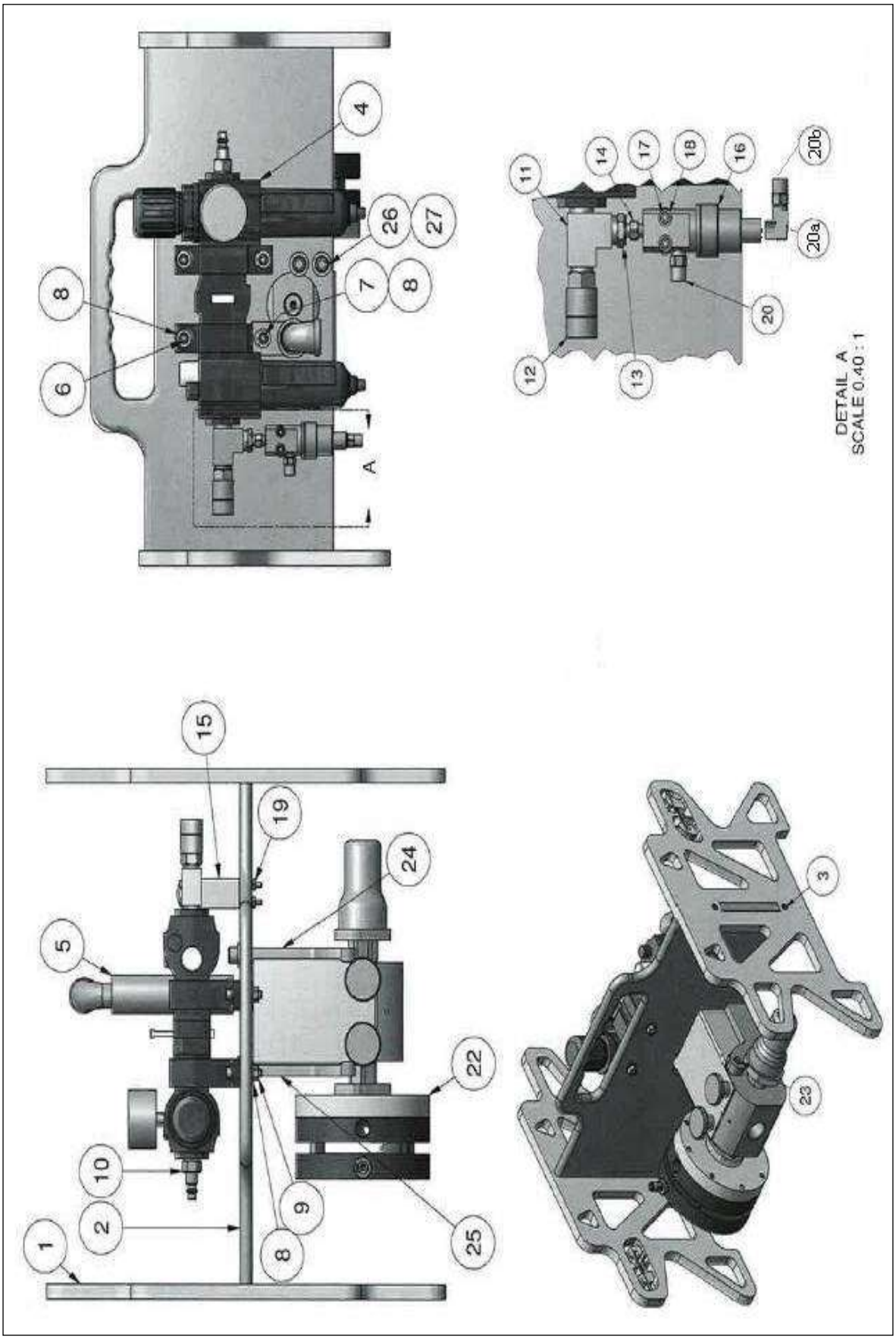
Rotating gun spare-parts assembly

Pos:	Part no.:	Qty.:	Description:
1	700551326	2	Terminator 1 Rotating Gun
2	700550810	2	Air-hose double x 7m
3	700550939	1	High pressure hose 3/8" – 3/8" Ø5mm for gun x 7m
4	700540393	1	Hose containment safety grip
5	700540391	2	Collar 3/8"
6	700540390	2	Gland nut 3/8"
7	700540387	2	Gland nut 9/16"
8	700540388	2	Collar 9/16"
9	700540353	N/A	Straight Connection 9/16" (Optional)
10	700540378	N/A	Connection straight 9/16" w/ collars & gland nuts (Optional)
11	700550852	1	High pressure hose 9/16" Ø8mm x 20m 36kpsi
12	700540919	1	Dual mode tumble box

Nozzle Configuration

Part no.:	Qty.:	Description:
700550603	2	NOZZLE UHP 0.013
700551171	2	NOZZLE UHP 0.012

Pneumatic Un-loader / Dump type assembly (Dual Mode)



Pneumatic Un-loader / Dump type assembly spare-parts list (Dual Mode)

Pos:	Part no.:	Qty.:	Description:
1	77408713	2	Side Plate, Tumble box Frame
2	77408714003	1	Base Plate, 40K Tumble Box
3	-	4	Screw, SHCS, ¼”-20 x ¾”,SS
4	700540823	1	FLR
5	77408857	1	Diffuser Cover
6	-	3	Screw, SHCS, ¼”-20 x 1-1/4”,SS
7	-	1	Screw, SHCS, ¼”-20 x 1-1/2”,SS
8	-	8	Flat Washer, ¼”,SS
9	-	4	Hex Nut, ¼:-20”,SS
10	700540583	1	Air Coupling, Male Thread
11	700540830	1	T-JOINT 3/8" (FXFXMB) BRASS
12	700540637	1	COUPLING AIR 3/8" BSPP M
13	1900335	1	Busing 3/8” x 1/8” NPTF,Brass
14	1900322001	1	Hex Nipple, 1/8”NPT Brass
15	700540829	1	ADAPTER BLOCK VERSA AIR PILOT
16	700540818	1	VALVE VERSA AIR PILOT
17	77408844	2	Hose, ¼”Push-Lock on Reel
18	77408845	2	Tee, ½”NPT
19	77408846	2	Street Elbow, ½” NPT
20	700540826	1	FITTING 1/8 NPTM X 1/4 TUBE
20a	700540917	1	ELBOW 1/8'" BSPT MF BRASS
20b	700540807	1	NIPPLE AIR 1-8" BSPT M
22	77408856	1	Dump Valve, 25K Hi Flow, Pilot Op
23	77408716	4	Tubing, ¼” MP, Air Act.Dump Valve
24	3177231	1	Air Pilot Valve, for Dump Valve
25	3177232	1	Clamp, Actuator,Air
26	-	4	Hex Bolt, ¼”-20 x 5-1/2”
27	-	4	Hex Nut, ¼”-20
1-27	700540919	1	TUMBLE BOX 40KPSI DUAL ASSY

Rotating gun spare-parts assembly

Rotating gun spare-parts assembly spare-parts list

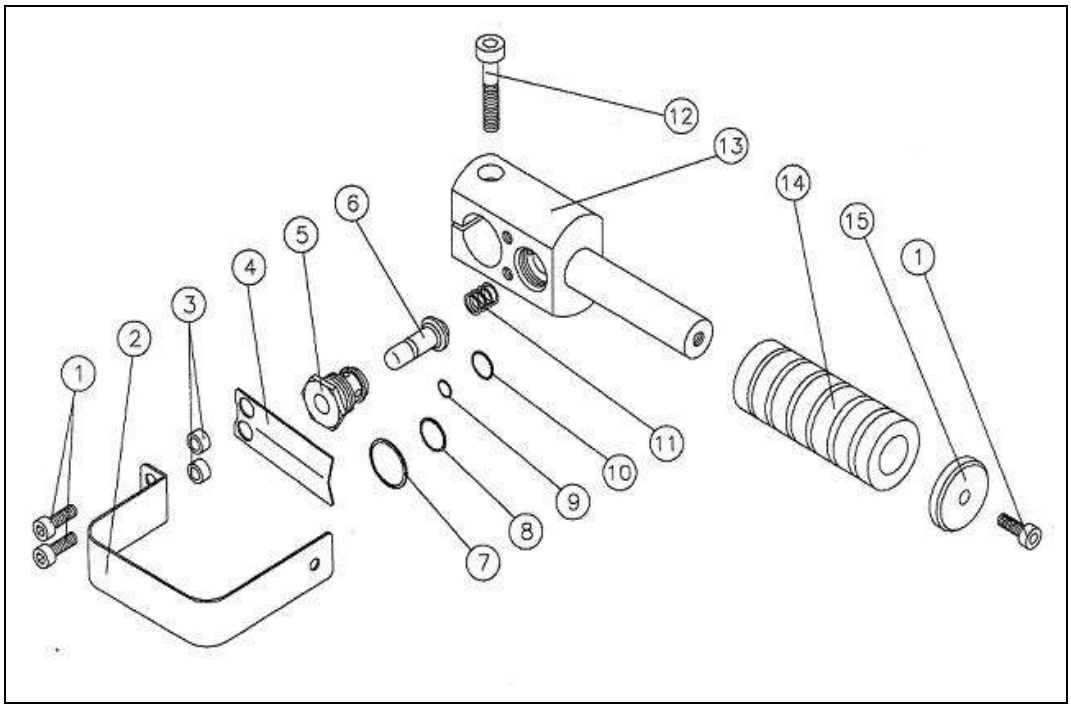
Pos:	Part no.:	Qty.:	Description:
1	700551304	1	Nozzle carrier sleeve
2	700550758	1	Front trigger, complete
3	700550759	1	Air-hose, in-coming
4	700550760	1	Air-hose, connecting
5	700540363	1	Quick coupling, male
6	700540481	1	Quick coupling, female
7	700550683	1	Timing pulley, driven
8	700550762	1	Taper lock bush
9	700510150	8	Dome nut, M6
10	700550763	1	Air push quick coupling, straight swivel 1/4”-m thread
11	700550764	1	Elbow 1/4”
12	700550682	1	Timing pulley, driving
13	700551293	1	Gearbox cover, gun UHP
14	700550740	1	Swivel assembly, complete
*15	700551294	1	Air drive motor
16	700550766	1	Air push quick coupling, elbow swivel 1/8” M thread
17	700550767	1	Elbow, compression fitting 1/4” male thread
18	700550761	1	Air hose, outgoing
19	700550768	1	Air pipe, trigger guard
20	700550681	1	Timing belt
21	700550735	1	Gearbox housing, gun UHP
22	700550721	1	Coupling, UHP barrel 9/16” thread
23	700550676	2	Button, brass
24	700550736	1	Bracket for gearbox, UHP gun
25	700550652	1	Barrel-tube, standard
	700550651	1	Barrel-tube, short (Optional)
	700550779	1	Barrel-tube, extra long (Optional)
26	700550765	1	Air push quick coupling, straight 1/8” F thread
27	700550769	1	Barrel shroud tube, standard
	700550770	1	Barrel shroud tube, short (Optional)
	700550780	1	Barrel shroud tube, extra long (Optional)
28	700550956	1	Dust Bushing
29	700551301	1	5Way nozzle guard
30	700551324	1	O Ring ID 46 Thk 2.6
31	700551302	1	5Way nozzle carrier w/o bearing
32	700551303	1	Bearing
33	700551318	1	4Way nozzle guard
34	700551325	1	O Ring ID 28 Thk 2.6
35	700551319	1	4Way nozzle carrier w/o bearing

Pos:	Part no.:	Qty.:	Description:
36	700550603	-	Nozzle 013 (Optional)
	700550602	-	Nozzle 014 (Optional)
	700550680	-	Nozzle 018 (Optional)
	700550601	-	Nozzle 020 (Optional)
	700550774	-	Nozzle 026 (Optional)
	700550773	-	Nozzle 036 (Optional)
	700550604	-	Nozzle plug(Optional)

Pos:	Part no.:	Qty.:	Description:
23+25+27	700550930	1	Barrel tube set complete standard (Optional)
23+25+27	700550931	1	Barrel tube set complete short (Optional)
23+25+27	700550932	1	Barrel tube set complete extra long (Optional)
29-32	700551300	1	5Way nozzle carrier assy complete
32-35	700551317	1	4Way nozzle carrier assy complete
2-28	700551326	1	Terminator 1, complete UHP 40 kpsi

* When purchasing item 15 (700551294), It is recommended to include item 12 (700550682).

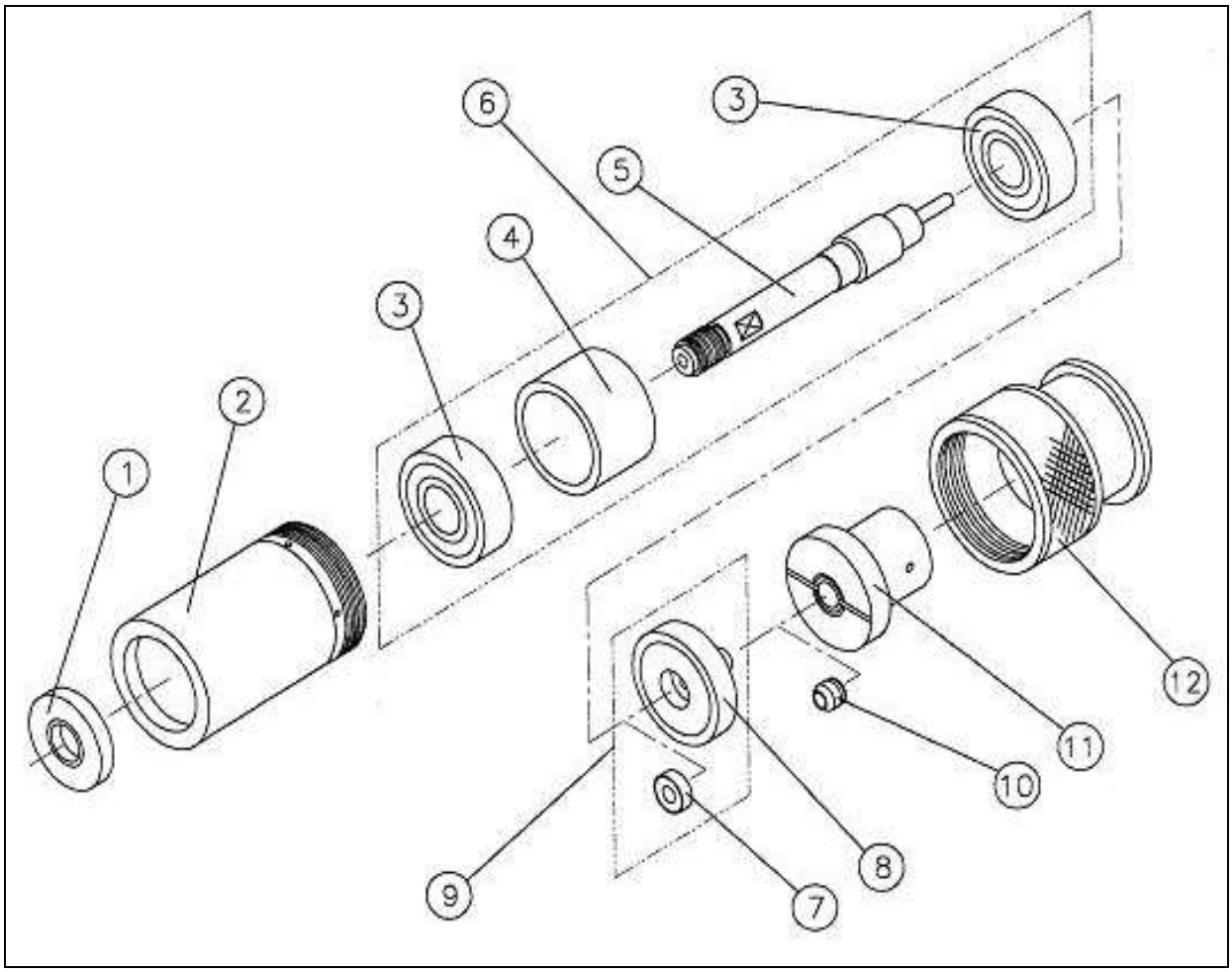
Front trigger for rotating gun assembly



Front trigger for rotating gun assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700510152	3	Screw M6 SS
2	700550731	1	Guard
3	700550730	2	Bushing
4	700550729	1	Trigger
5	700550727	1	Valve seat
6	700550728	1	Valve pin
7	700540120	1	O-ring
8	700550756	1	O-ring
9	700650055	1	O-ring
10	700550755	1	O-ring
11	700550757	1	Spring
12	700510153	1	Screw M8 SS
13	700550724	1	Valve-body
14	700550725	1	Handle
15	700550726	1	Washer
1-15	700550758	1	Front trigger, complete

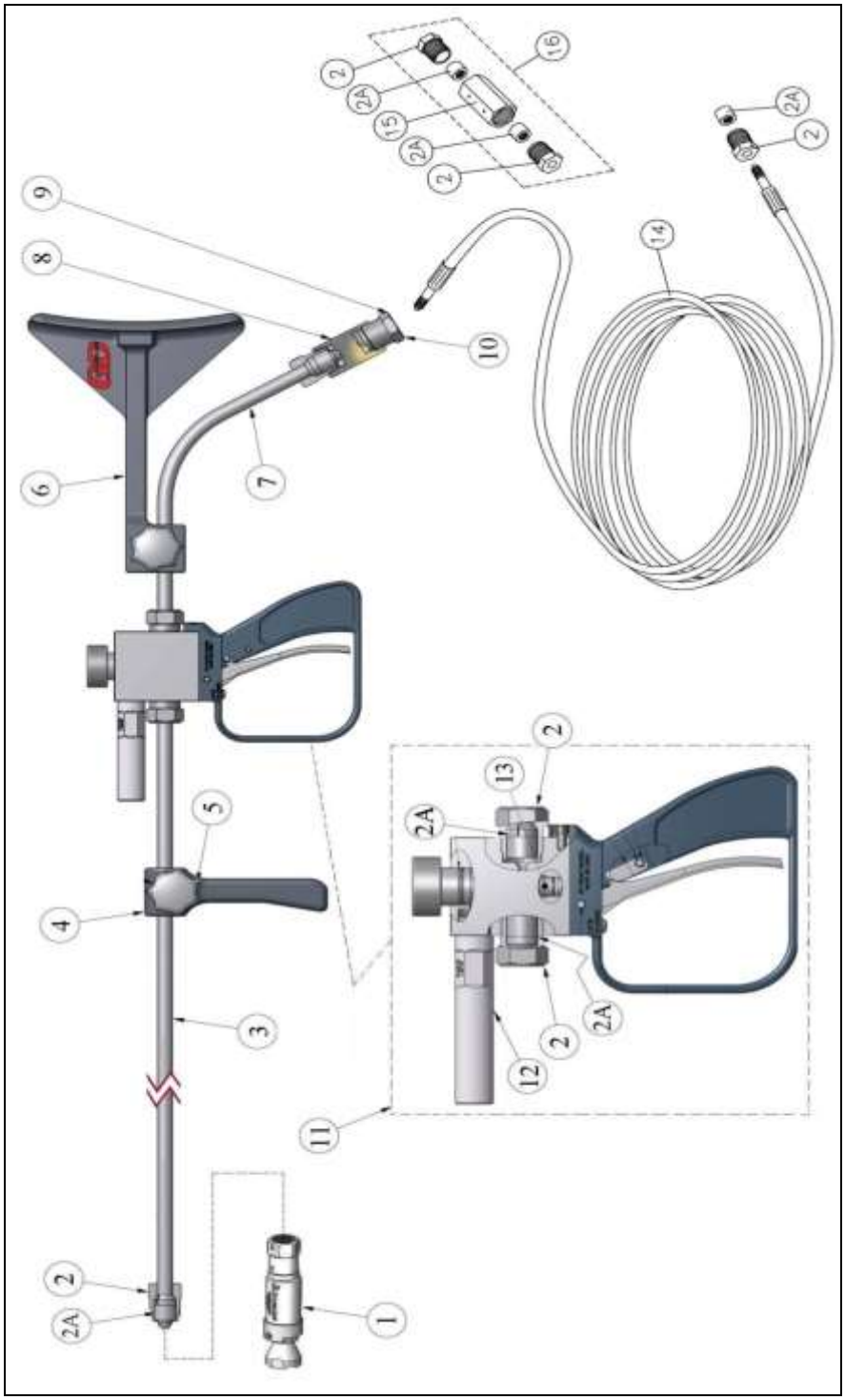
Swivel for rotating gun assembly



Swivel for rotating gun assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	700550718	1	Swivel oil seal, front
2	700550741	1	Swivel housing
3	700550744	2	Bearing
4	700550751	1	Spacer
5	700550742	1	Spindle
6	700550743	1	Spindle assembly
7	700550746	1	Seal, back-up ring
8	700550745	1	Back-up ring
9	700550747	1	Back-up ring with seal
10	700550748	1	Seal assembly
11	700550749	1	Inlet adaptor
12	700550750	1	Retaining cap
1-12	700550740	1	Swivel complete

Trigger dump-gun & hose assembly



Trigger dump-gun & hose assembly spare-parts list

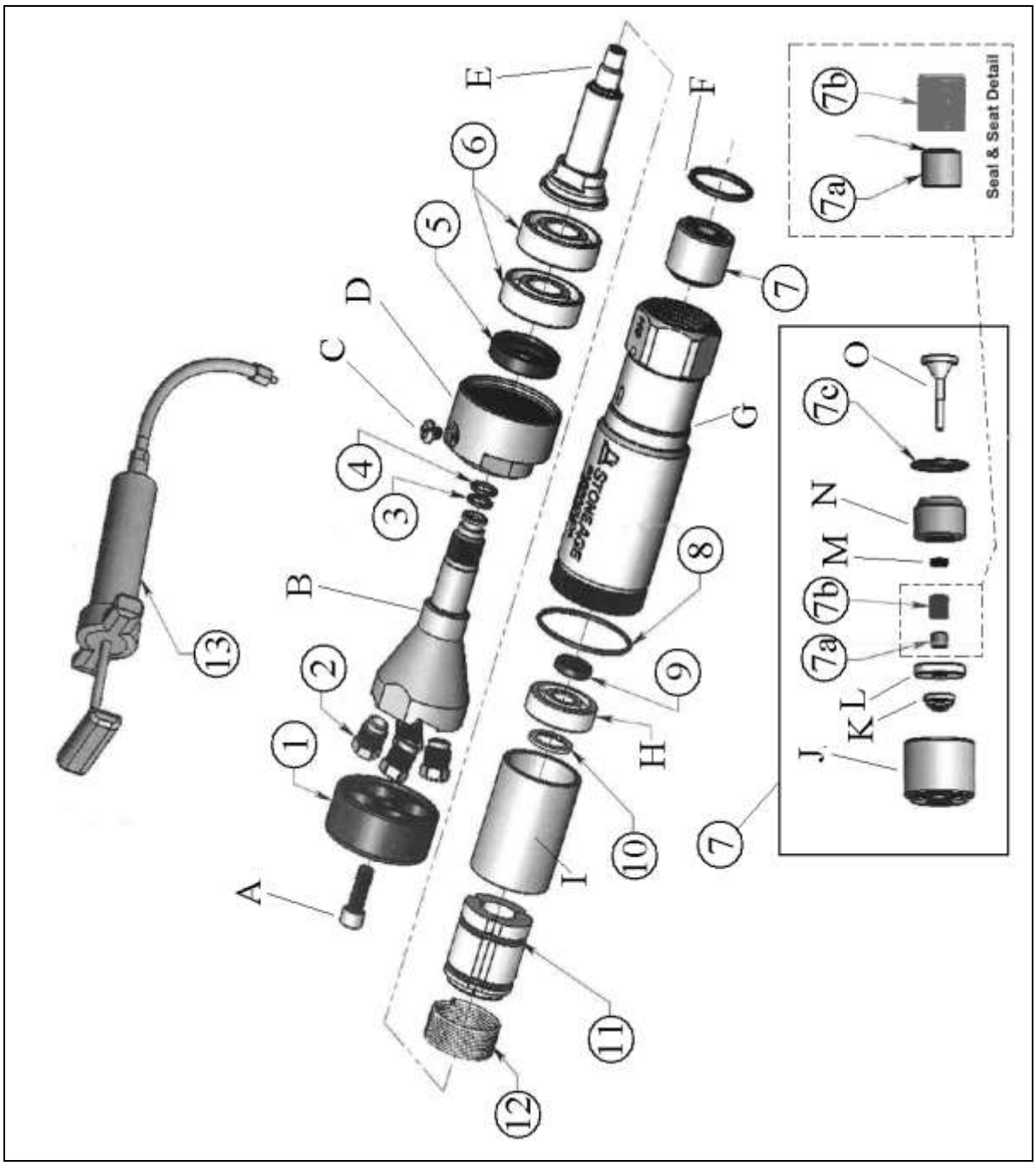
Pos:	Part no.:	Qty.:	Description:
1	700551279	1	ROTATING NOZ BARRACUDA 40K/HF
2	700540387	4	GLAND NUT 9/16 S.S.
2A	700540388	4	COLLAR 9/16 S.S.
3	700551487	1	LANCE PIPE 9/16" HP L48" SS
4	700551488	1	FRONT GRIP POLYMER
5	700551489	1	GRIP KNOB
6	700551490	1	SHOULDER SUPPORT

7	700551491	1	LANCE PIPE 60DEG BENT-40K
8	700540353	1	COUPLING 9/16" STRAIGHT
9	700540387	1	GLAND NUT 9/16 S.S.
10	700540388	1	COLLAR 9/16 S.S.
11	700551492	1	DUMP GUN/ HANDLE ASSEMBLY 40K
12	700540822	1	DUMP DISCHARGER TUBE
13	700551159	1	REPAIR KIT 40K HG DUMP
2-13	700550906	1	DUMP GUN COMPLETE 40K
14	700550852	1	High pressure hose 9/16” Ø8mm x 20m 36kpsi
15	700540353	N/A	Straight Connection 9/16” (Optional)
16	700540378	N/A	Connection straight 9/16” w/ collars & gland nuts (Optional)
2	700540387	2	GLAND NUT 9/16 S.S. (Optional)
2A	700540388	2	COLLAR 9/16 S.S. (Optional)

Nozzle Configuration

Part no.:	Qty.:	Description:
700551104	2	NOZZLE BARRACUDA 40K 0.018
700551337	2	NOZZLE BARRACUDA 40K 0.017

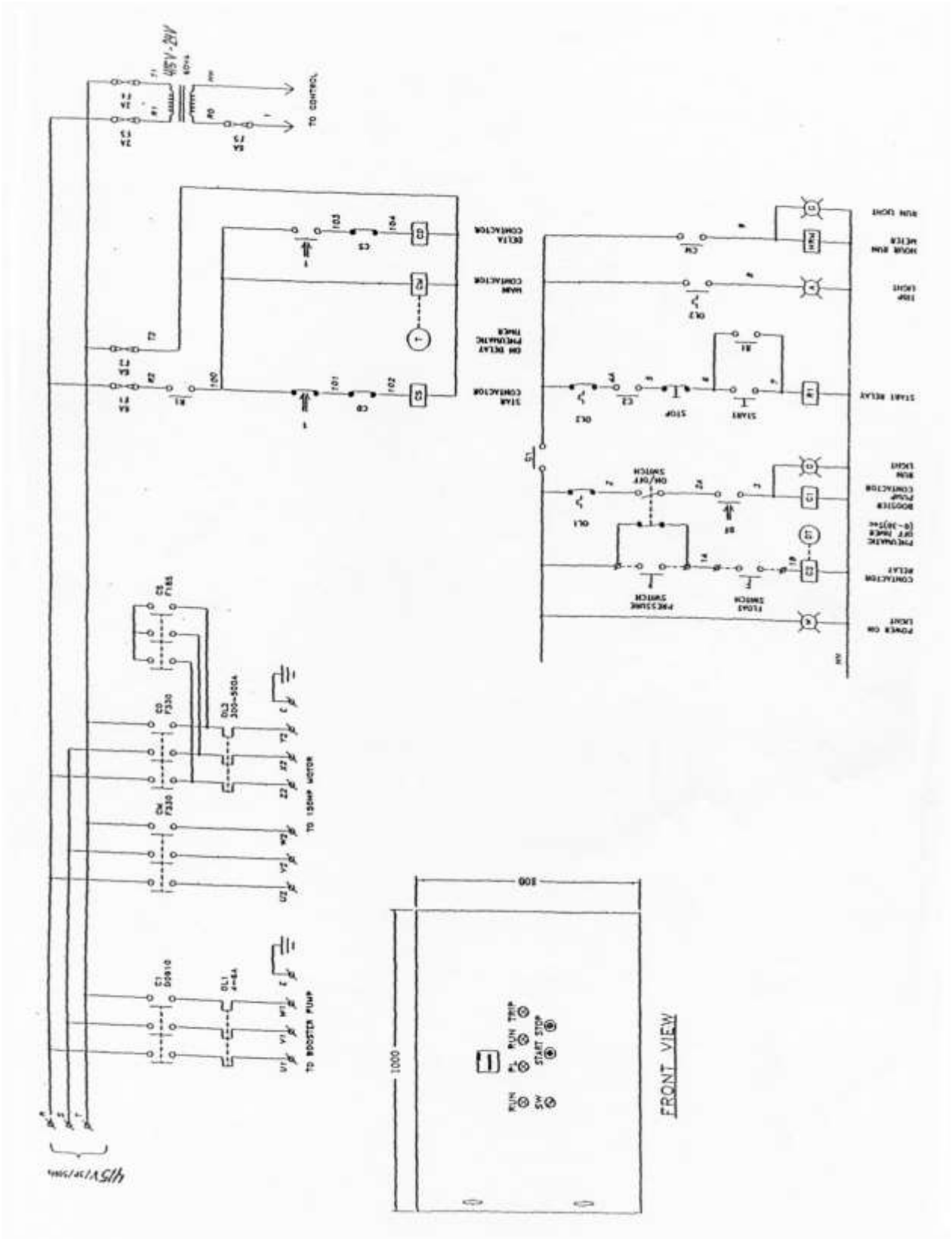
Rotating Nozzle Assembly



Rotating Nozzle Assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	70051410	1	SHIELD NOZ. 40K H/F
2	700551104	2	NOZZLE BARRACUDA 40K 0.018
	700551337	2	NOZZLE BARRACUDA 40K 0.017
3	700551143	1	MULTI JET BACK-UP RING
4	700551144	1	MULTI JET O-RING
5	700551145	1	MULTI JET SEAL, LARGE
6	700551146	2	MULTI JET BEARING, THRUST
7	700551332	1	CARTRIDGE ASSEMBLY BC 505-S
7a	-	1	Carbide Seat
7b	-	1	H.P Seal
7c	-	1	O-ring
8	700551153	1	MULTI JET O-RING
9	700551154	1	MULTI JET SEAL, SHAFT SMALL
10	700551156	1	MULTI JET WASHER
11	700551184	1	MULTI JET GARTER SPRING
12	700551142	1	MULTI JET SPRING
13	700551165	1	MULTI JET SYRINGE
A	-	1	Bolt
B	-	1	Head
C	-	1	Port Screw
D	-	1	Cab
E	-	1	Shaft
F	-	1	O-ring
G	-	1	Body
H	-	1	Bearing
I	-	1	Sleeve
J	-	1	Cartridge
K	-	1	Seat Face
L	-	1	Seal
M	-	1	Compression Spring
N	-	1	Inlet seat
O	-	1	Mandrel
1-12	**700551279**	**1**	**ROTATING NOZ 40K/HF**

6. Wiring diagram



7. Declaration and Warranty

EU declaration of conformity

EU Declaration of Conformity

Product:	**Electric powered** **Ultra high-pressure** **Water blaster**
Type:	C-2070/26E (50Hz) & C-2070/26E (60Hz)
Description:	380-440V 0~, 50/60Hz, IP 54 - 2070 [bar]
The design of the unit corresponds to the following pertinent regulations:	EC Machine Directive 98/37/ECC EC Low Voltage Directive 72/23/EEC EC EMC Directive 89/336/EEC
Applied harmonized standards:	EN 292, EN 60335-2-79, EN 55014-1, EN 55014-2. EN 61000-3-2
Applied national standards and technical specifications:	DIN EN 60335-2-79

DEN-SIN - a division of Nilfisk-Advance Pte Ltd.
No 5 Tuas Avenue 2
Singapore 639445
Tel: +65 62681006
Fax: +65 62684916

Singapore, Oct 2008

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Ampornsittikul Preecha
General Manager

Warranty

DEN-SIN warrants all equipments of its manufacture furnished under this agreement to be free from defect in workmanship and material for a period of one year from the date of invoice of the equipment. This warranty does not cover normal wear and tear, consumable items, or part failures caused by (i) accident, (ii) abuse, or (iii) failure to maintain the DEN-SIN system containing the affected parts in accordance with DEN-SIN technical specification. All labour is the responsibility, and the expense of the Buyer. The liability of Seller under this warranty is limited, at Seller's option, solely to repair or replacement with equivalent articles. This warranty is condition upon (a) Seller being notified in writing by Buyer within one week after discovery of defects;
(b) the return of defective articles to Seller, transportation charges prepaid by Buyer; and (c) Seller's examination of such article disclosing to its satisfaction that such defects were not caused by negligence, misuse, improper maintenance, improper installation, accident, or unauthorized repair or alteration.
Accessories or equipment furnished by DEN-SIN but manufactured by others, shall carry the warranty that its manufacturer has conveyed to DEN-SIN, and which may be passed on to the purchaser. The original warranty period of any article, which has been repaired or replaced by DEN-SIN, shall not thereby be extended.